

**DECEMBER 1998**  
**VOLUME 40**  
**NUMBER 12**

# **STORM DATA**

**ANNUAL SUMMARIES  
WILL APPEAR IN A  
FUTURE ISSUE**



**AND UNUSUAL WEATHER PHENOMENA  
WITH LATE REPORTS AND CORRECTIONS**



**noaa** NATIONAL OCEANIC AND  
ATMOSPHERIC ADMINISTRATION

NATIONAL ENVIRONMENTAL SATELLITE  
DATA, AND INFORMATION SERVICE

NATIONAL CLIMATIC DATA CENTER  
ASHEVILLE, N.C.

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**Cover:** Water from sprinklers and a rare freezing event in South Central California left these oranges covered with icicles. The damage to the California citrus crop is estimated over \$600 million. (*Photograph courtesy of Gary Kazanjian - The Hanford Sentinel, Hanford, California - ©1998 - All right reserved*)

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### **STORM DATA**

(ISSN 0039-1972)

National Climatic Data Center

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Assistant Editor: Stuart Hinson

**STORM DATA** is prepared, funded, and distributed by the National Oceanic and Atmospheric Administration (NOAA). The Outstanding Storms of the Month section is prepared by the Data Operations Branch of the National Climatic Data Center.

The Storm Data and Unusual Weather Phenomena narratives and Hurricane/Tropical Storm summaries are prepared by the National Weather Service. Monthly and annual statistics and summaries of tornado and lightning events resulting in deaths, injuries, and damage are compiled by cooperative efforts between the National Climatic Data Center and the Storm Prediction Center.

**STORM DATA** contains all confirmed information on storms available to our staff at the time of publication. However, due to difficulties inherent in the collection of this type of data, it is not all-inclusive. Late reports and corrections are printed in each edition.

Maps of the National Weather Service County Warning Areas which are used in the Storm Data and Unusual Weather Phenomena section will be printed in all editions.

Except for limited editing to correct grammatical errors, materials submitted are generally published as received.

Note: "None Reported" means that no severe weather occurred and "Not Received" means that no reports were received for this region at the time of printing.

Subscription, pricing, and ordering information is available from:

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151 Patton Avenue  
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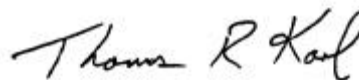
The editors of **STORM DATA** solicits your help in acquiring photographs (prints or slides; black and white, or color), maps, clippings, etc. of significant or unusual weather events (past or present). These could be for use in the "Outstanding Storms of the Month" section of **STORM DATA**. We request our subscribers or other interested persons to mail such items to:

Stuart Hinson  
National Climatic Data Center  
151 Patton Avenue  
Asheville, NC 28801

Any such items received by the editor will be for use in **STORM DATA** only. Any other use will be with the permission of the owner of said items. Materials submitted will be returned if requested in the original submission.

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"I certify that this is an official publication of the National Oceanic and Atmospheric Administration and is compiled from information received at the National Climatic Data Center Asheville, North Carolina 28801-2733."



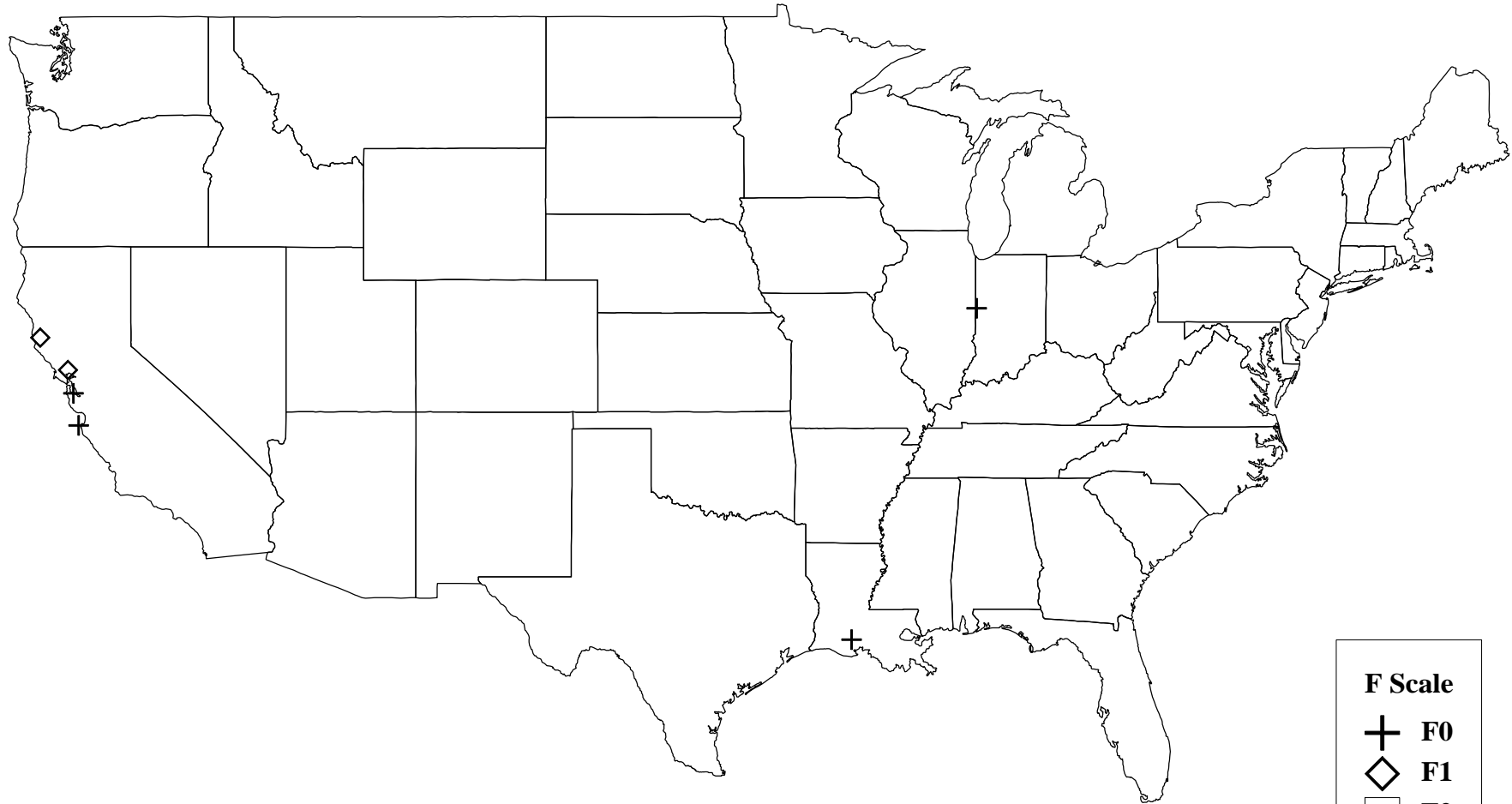
Thomas R. Karl  
Director,  
National Climatic Data Center

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The Cyclone Track Map which usually appears on this page is not available for December 1998.

Should the data become available in the future, a cyclone track map will be produced and printed in a subsequent issue.

# December 1998 Confirmed Tornadoes



F Scale	F0	F1	F2	F3	F4	F5	Total
Number	4	2	0	0	0	0	6

## F Scale

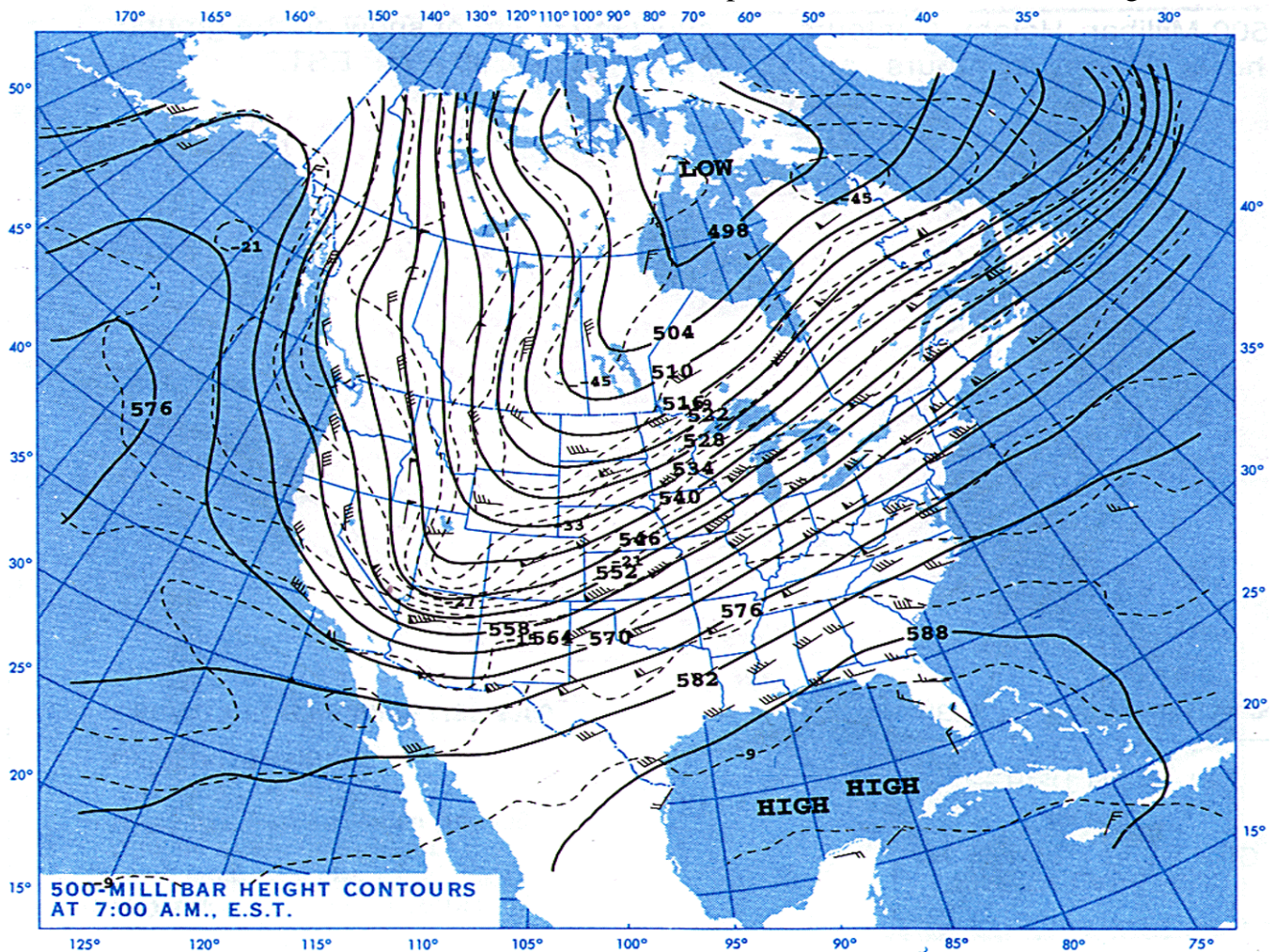
- + F0
- ◇ F1
- F2
- F3
- △ F4
- ★ F5

## OUTSTANDING STORMS OF THE MONTH

### 1. FREEZING TEMPERATURES AND SNOW IN SOUTH-CENTRAL CALIFORNIA

A rare freezing-temperature event occurred in late December as an arctic airmass moved over central California. During December 18<sup>th</sup> through the 22<sup>nd</sup>, high pressure off the U.S. west coast brought northerly winds, cold air and a dusting of snowfall into the San Joaquin Valley. Morning low temperatures in the valley only reached into the mid teens. Average morning lows for December are in the mid to upper 30's. High temperatures only reached into the upper 20's on the 23<sup>rd</sup>. Freezing temperatures occurred at night through the 30<sup>th</sup>. Total economic losses are estimated at \$2.7 Billion with almost \$600 Million in direct losses of agricultural crops, mostly to the citrus industry

**Below:** A 500 millibar map of North America at 7:00 AM EST (4:00 AM PST) on December 21st. The map shows a high-amplitude ridge in the Gulf of Alaska and a deep trough digging into Southern California. This allows cold arctic air to drain into the Southern California valleys. This long-wave pattern was in effect from December 18-22. (Map courtesy of the National Center for Environmental Prediction, National Oceanic and Atmospheric Administration, Washington, DC)



# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Persons Injured	Damage Property		
ALABAMA, North Central									
ALZ006	Madison								
	01	0000CST			0	0	0	0	Excessive Heat
	31	2359CST							
	The average monthly temperature was 51.3 degrees and that was the second warmest reading ever recorded for December.								
ALZ024	Jefferson								
	01	0000CST			0	0	0	0	Excessive Heat
	31	2359CST							
	The average monthly temperature was 54.6 degrees and that was the second warmest reading ever recorded for December.								
ALZ044	Montgomery								
	01	0000CST			0	0	0	0	Excessive Heat
	31	2359CST							
	The average monthly temperature was 57.5 degrees and that reading tied the fourth warmest reading ever for December.								
ALZ044	Montgomery								
	01	0000CST			0	0	0	0	Drought
	31	2359CST							
	The monthly rainfall was 1.38 inches and that was the second lowest rainfall total ever recorded for December.								
ALZ006	Madison								
	04	1500CST			0	0	0	0	Excessive Heat
	A new record high temperature of 79 degrees was set for this date.								
ALZ024	Jefferson								
	04	1500CST			0	0	0	0	Excessive Heat
	A new record high temperature of 78 degrees was set for this date.								
ALZ044	Montgomery								
	04	1500CST			0	0	0	0	Excessive Heat
	A new record high temperature of 82 degrees was set for this date.								
ALZ006	Madison								
	05	1500CST			0	0	0	0	Excessive Heat
	A new record high temperature of 79 degrees was set for this date.								
ALZ024	Jefferson								
	05	1500CST			0	0	0	0	Excessive Heat
	A new record high temperature of 79 degrees was set for this date.								
ALZ044	Montgomery								
	05	1500CST			0	0	0	0	Excessive Heat
	The record high temperature of 83 degrees was tied.								
ALZ006	Madison								
	06	1500CST			0	0	0	0	Excessive Heat
	A new record high temperature of 76 degrees was set for this date.								
ALZ024	Jefferson								
	06	1500CST			0	0	0	0	Excessive Heat
	A new record high temperature of 78 degrees was set for this date.								
ALZ006	Madison								
	07	1500CST			0	0	0	0	Excessive Heat
	A new record high temperature of 77 degrees was set for this date.								
ALZ044	Montgomery								
	08	1500CST			0	0	0	0	Excessive Heat
	The record high temperature of 82 degrees was tied.								
ALZ001>008-011>017	Lauderdale - Colbert - Franklin - Lawrence - Limestone - Madison - Morgan - Marshall - Marion - Lamar - Fayette - Winston - Walker - Cullman - Blount								
	23	0200CST			1	0	14.4M	0	Ice Storm
	25	1200CST							
	A winter storm brought a mixture of freezing rain...sleet...and rain to the northern half of Alabama. The northwestern quarter of Alabama was especially hard hit. The precipitation began in a narrow band across Fayette, Walker, Cullman, and Marshall counties around 2 am and then around 5am in the rest of the counties and lasted until early afternoon on the 24th. The northwestern quarter of the state saw temperatures at or below freezing for the majority of the event. Liquid equivalent								

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property		

December 1998

## ALABAMA, North Central

precipitation ranged from one to three inches. Significant ice accumulations of one half to one inch were common across the area. Numerous trees were down across every county. Significant power outages were encountered in all counties and many locations did not return to service until the 26th or 27th. The National Guard was activated in a few northwestern counties to help with the cleanup duties. Numerous roads were closed during the event which included Interstate 65 and 565 in the Huntsville area. One fatality occurred in Huntsville when a homeless man died of exposure. Numerous multiple vehicle and single automobile accidents occurred due to the icy road conditions. These accidents resulted in at least 5 fatalities and numerous minor injuries. One fatality occurred during the cleanup effort when the worker came into contact with a live electrical wire. M470U

**ALZ009>010-  
018>027-030>032-034**

**Jackson - Dekalb - Etowah - Calhoun - Cherokee - Cleburne - Pickens - Tuscaloosa - Jefferson - Shelby - St. Clair - Talladega - Sumter - Greene - Hale - Bibb**

23	0600CST	0	0	126K	0	Ice Storm
24	1800CST					

A winter storm brought a mixture of freezing rain, sleet, and rain to the northern half of Alabama. The precipitation began in the morning of the 23rd and lasted until afternoon on the 24th. The temperatures during this event hovered around the freezing mark and remained slightly above freezing long enough for most of the precipitation to fall as rain. Liquid equivalent precipitation measured one to three inches throughout the entire event. Ice accumulations up to one quarter inch occurred briefly during the overnight and early morning hours. These accumulations were generally confined to tree tops, bridges, other elevated surfaces, and higher elevations. Northern Jefferson and Western Etowah counties both reported some trees down along with many branches. Northern Jefferson county also experienced downed power lines that caused sporadic power outages. Road closures were temporary during the morning hours of the 23rd including portions of Interstate 65 and 20/59 in Birmingham.

## ALABAMA, Southeast

NONE REPORTED.

## ALABAMA, Southwest

NONE REPORTED.

## ALASKA, Northern

**AKZ003-006-010**

**Lower Kobuk Valley-Northern Seward Peninsula - Southern Seward Peninsula-Eastern Norton Sound - Yukon Delta**

02	2100AST	0	0	Blizzard
03	1600AST			

A developing storm moved northeast over the Bering Sea before diminishing over the inner west coast of Alaska. Blizzard conditions occurred over portions of the west coast of Alaska, though probably not over the Saint Lawrence Island and Bering Strait Coast. Blizzard conditions occurred at: Zone 10: Cape Romanzof, Hooper Bay, Zone 3: Kotzebue, Zone 6: Unalakleet, Nome (close).

**AKZ003-006-009>010**

**Lower Kobuk Valley-Northern Seward Peninsula - Southern Seward Peninsula-Eastern Norton Sound - St. Lawrence Island-Bering Strait Coast - Yukon Delta**

16	1800AST	0	0	Blizzard
19	1100AST			

**AKZ003**

**Lower Kobuk Valley-Northern Seward Peninsula**

17	2300AST	0	0	Extreme Windchill
18	0700AST			

**AKZ009**

**St. Lawrence Island-Bering Strait Coast**

19	0100AST	0	0	High Wind (G53)
	0500AST			

A storm south of the central Aleutian Islands moved north into the Bering Sea then northwest to Far East Russia and weakened. Blizzard condition occurred at: Zone 10: Hooper Bay, Cape Romanzof, Zone 9: Tin City, Zone 6: Nome, Golovin, Unalakleet (close), and Zone 3: Kotzebue, Selawik, Kivalina (close). On the 19th, the PMEL (Pacific Marine Environmental Laboratory) platform at Cape Prince of Wales on the Bering Strait Coast reported wind gusts to 60 mph. Additionally on the early morning of the 17th, wind chills of -70 to 81 below occurred over zone 3: Kotzebue reached -72 F; Selawik reached -81 F.

**AKZ006>007**

**Southern Seward Peninsula-Eastern Norton Sound - Tanana Valley**

27	1300AST	0	0	High Wind (G63)
30	0100AST			

In the midst of a strong pressure gradient over northern Alaska, high pressure over western Canada shifted slightly to allow a down-valley pressure gradient from the Canada border of Zone 7 to Delta Junction. Peak gust at Delta Junction during the event was 54 mph. During the same period, several disturbances aloft moved over Zone 6 causing winds to increase in channeled areas; in particular Golovin reported gusts to 66 mph on the 27th and gusts to 72 mph on the 29th.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## ALASKA, Southeast

NOT RECEIVED.

## ALASKA, Southern

### **Bristol Bay Coastal**

#### **King Salmon**

**02 1500AST**  
**03 0900AST**

**0 0**

**Storm Surge**

Strong onshore winds following a vigorous frontal passage Thursday produced tides up to 4 feet above normal. This was very unusual for this time of year...and came in concert with abnormally high tides. Ice, also, was noticeably absent from much of the coast. Although no reports of damage were received, this was not unexpected due to the absence of marine-related activity during this time of year. Most boats had been pulled out of the water months before.

### **Kuskokwim Delta**

#### **Bethel**

**02 1500AST**  
**03 0900AST**

**0 0**

**Storm Surge**

Strong onshore winds following a vigorous frontal passage Thursday produced tides up to 4 feet above normal. This was very unusual for this time of year...and came in concert with abnormally high tides. Ice, also, was noticeably absent from much of the coast. Although no reports of damage were received, this was not unexpected due to the absence of marine-related activity during this time of year. Most boats had been pulled out of the water months before.

### **AKZ015**

#### **Cook Inlet**

**03 1200AST**  
**04 1500AST**

**0 0**

**50K**

**Heavy Snow**

Heavy snow was reported across the Kenai Peninsula late Thursday and Friday...with areas around Kenai and Nikiski receiving in excess of 1 foot of snow in about 18 hours...closing several schools, causing major transportation delays and resulting in several power outages for Homer Electric. At the Alyeska ski resort, worried owners were relieved at the 1 1/2 to 2 feet of new snow received at the mid and top levels. Cold arctic air, already in place across the mainland, led to areas of freezing rain as far east as the Kenai Peninsula.

### **AKZ017>019**

#### **Central Gulf Coast - Kodiak Island-Eastern Alaska Peninsula - Western Alaska Peninsula**

**05 1500AST**  
**07 0600AST**

**0 0**

**High Wind (G48)**

An intensifying low 300 miles south of Chignik (along the Alaska Peninsula) late Saturday evening, moved to 300 miles south of Kodiak as an intense 956 mb center 9am Sunday. It then continued northeast through the Gulf of Alaska, weakening near Middleton Island Monday afternoon. Brisk northeast winds preceded the front...which extended in an arc around the low to 60 miles south of Kodiak then east southeastward Sunday morning and just inland along the northeast Gulf Coast early Monday. Gusts reached 54 mph at Cold Bay and Kodiak and 55 mph at Middleton Island ahead of the front.

Additionally, Kodiak broke a daily precipitation record with 2.75 inches falling on Sunday.

### **AKZ018**

#### **Kodiak Island-Eastern Alaska Peninsula**

**09 0000AST**  
**14 2359AST**

**0 0**

**High Wind (G41)**

Brisk northwesterly winds blew across Kodiak Wednesday, December 9th through Monday, December 14th. Gusts range from a low of 41 to a high of 47 mph.

### **AKZ018**

#### **Kodiak Island-Eastern Alaska Peninsula**

**14 0000AST**  
**2359AST**

**0 0**

**Heavy Snow**

Cold air, already in place across the area behind the arctic front, received copious amounts of moisture from southeasterly, wet mid level winds. Overrunning produced 11 inches of new snow on Monday...setting a new record for the date.

### **AKZ013-015-017>018**

#### **Susitna Valley - Cook Inlet - Central Gulf Coast - Kodiak Island-Eastern Alaska Peninsula**

**15 0000AST**  
**18 1900AST**

**0 0**

**High Wind (G55)**

Strong, arctic northerly 'outflow' winds preceded an increasingly strong high that moved across the state from west to east. At 9am Tuesday, the center was 1024mbs about 60 miles northwest of Bethel. By 9pm Wednesday, the center was a very respectable 1049mb center near Tanana and by 3am Friday an intense 1072mb center near Mayo, Canada. Wind gusts reached 63 mph at Big

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated		December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	
Character of Storm									

## ALASKA, Southern

River Lakes on the west side of Cook Inlet, 55 mph at the Kodiak airport, 59 mph at the Valdez airport, 45 mph at Seward and 52 mph at Whittier. On the 'back side' of the high, brisk southeast wind gusts reached 54 mph at Glen Alps, located at about the 2200 foot level of the Anchorage Hillside. Wind chills in excess of minus 45 were calculated in the Susitna Valley and just west of Cook Inlet at the Big River Lakes reporting site.

In addition to the strong northerly winds, surface pressures reached values above 31.00 inches of mercury (which caused several observational problems, barometers which were "off the charts" and other aviation related questions). These high pressure readings had not been a weather problem since 1989, when flights were actually grounded because altimeters could not be set and minimal amounts of daylight caused many flights to operate under IFR conditions.

**AKZ013-015**

### **Susitna Valley - Cook Inlet**

**15 0500AST 0 0 Heavy Snow**  
**2030AST**

Snow began late Monday evening along the Upper Anchorage Hillside and areas near Turnagain Arm...and at the Anchorage International Airport just after 1am Tuesday. Snow ended from west to east...at the Anchorage International Airport at 4am Wednesday and across the rest of the area during the next 6 hours.

Total snowfall around the Anchorage area ranged from 7 inches at the Sand Lake facility to 10 inches along the hillside. In Eagle River, amounts up to 15 inches were reported. Further north, around Palmer, 7-10 inches fell in the core area, 10-12 inches on Knik River Road and other areas just outside of Palmer, with 6-7 inches reported from Big Lake northward.

**AKZ011-016-020>021**

### **Kuskokwim Delta - Bristol Bay Coastal - Aleutian Islands - Pribilof Islands**

**15 0600AST 0 0 High Wind (G57)**  
**17 0600AST**

A moderate frontal system moved into the Central Aleutians late Monday then into the extreme east-central Bering Sea midday Wednesday. Preceding this front, brisk southeasterly winds were reported. Gusts of 59 mph were recorded at Saint George Island in the Pribilofs while winds reached 53 mph at Dutch Harbor. Wind gusts of 66 mph were recorded at Cape Romanzof and Cape Newenham.

**AKZ011-016-019>020**

### **Kuskokwim Delta - Bristol Bay Coastal - Western Alaska Peninsula - Aleutian Islands**

**17 0000AST 0 0 High Wind (G68)**  
**19 0600AST**

A moderate front from the eastern Aleutians Thursday moved into the Alaska Peninsula and extreme western Bristol Bay Friday afternoon. Strong southeast winds were observed in many areas ahead of the front.

Wind gusts around Dutch Harbor reached 75 mph Thursday morning as reported by the contract observer.

Along the Alaska Peninsula, southeast wind gusted to 48 mph at Cold Bay late Thursday evening...remaining above 40 mph for the next 24 hours. At Port Heiden, even stronger southeast wind gusts to 58 mph were observed just after noon Friday.

Along the Bristol Bay coast and the Kuskokwim Delta, wind gusts reached 78 mph just after 9pm Thursday, where blizzard conditions were reported off and on for a 6 hour period from 6pm until just before midnight. Iliamna recorded wind gusts of 52 mph, Togiak 60 mph, Mekoryuk 62 mph, Cape Romanzof 71 mph as the front moved closer late Friday.

**AKZ012>013**

### **Kuskokwim Valley - Susitna Valley**

**23 1500AST 0 0 High Wind (G52)**  
**24 0030AST**

A vigorous upper low brought an end to inversion conditions that plagued much of southcentral Alaska for over a week. Dense fog was reported around the Anchorage area Monday night and Tuesday morning and again Tuesday night and Wednesday morning. Colder air aloft began to rush through the Chugach Mountain Range passes and around the passes through the northwest Alaska Range. Although persistent high pressure had weakened in the southeast Mainland, surface pressure falls in the southwestern part of the State more than compensated and actually strengthened low level pressure gradients. Wind gusts reached 60 mph at a new mesonet site near Colony High School in the Matanuska-Susitna Valley late Wednesday and early Thursday. Wind gusts also were strong in the extreme northern Kuskokwim Valley near McGrath...where a remote sensor recorded a gust of 51 mph.

**AKZ011>012**

### **Kuskokwim Delta - Kuskokwim Valley**

**27 0900AST 0 0 Extreme Windchill**  
**28 2100AST**

Brisk northeast wind combined with very cold air to produce wind chills from 40 to locally 70 below across the area.

**AKZ013-015**

### **Susitna Valley - Cook Inlet**

**27 1200AST 0 0 High Wind (G60)**  
**30 0200AST**

Strong northeast wind, again set off by cold air moving into the area from the east and northeast behind a vigorous cold front, began across the Matanuska/Susitna Valley just after noon Sunday...finally diminishing Tuesday morning. Wind gusts reached 69

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Property	Crops	Character of Storm
Killed	Injured									

## ALASKA, Southern

mph at a recently installed mesonet site...more into the core of the high winds. Gusts reached 53 mph at Wasilla and 61 mph at the Palmer airport early Monday morning. Damage was relatively minor...with a trampoline in a ditch, drifted snow over parked cars and several heavy signs removed from their positions. At the Tony chevrolet-Buick dealership, Greg Bailey reported "Every year at this time, you've got to dig them out"...referring to cars parked outside. "When the wind starts blowing and there's snow on the ground, it gets up underneath the cars and just piles up to where they won't move. It's really hard snow when it's windblown-kind of like concrete." Bailey said the problem grew so bad that he and his co-workers parked trucks and cars in back of the dealership.

A few miles west, a metal frame was all that was left of the menu board by the drive-through lane at Wendy's Old-Fashioned Hamburgers restaurant. Customers had to rely on their memories or on a menu inside when ordering their meals. Anne Nichols, the restaurant's manager said "The wind comes ripping through this alley thing where our drive-through is and it gets everything."

Additionally, brisk north winds west of the Parks Highway, combined with the 'Matanuska' northeasterly winds and spread down across central Cook Inlet. The M/V "Heritage Service" recorded wind gusts of 46 mph and freezing spray. Gusts reached 30 mph from the north across west Anchorage...and a brief easterly shot of wind produced 41 mph gusts around Glen Alps...at around the 2200 ft level of the surrounding mountains. Easterly wind gusts of 43 mph were recorded at the Portage Glacier ASOS at just before 2am Tuesday morning and again between midnight and 1am Wednesday.

Wind chills dipped down below 30 below in some areas as a result of the wind.

## **AKZ015-017**

### **Cook Inlet - Central Gulf Coast**

<b>28</b>	<b>1500AST</b>	<b>0</b>	<b>0</b>	<b>Heavy Snow</b>
<b>30</b>	<b>1800AST</b>			

Arctic air combined with low pressure systems east of Kodiak and south and southeast of the Kenai Peninsula to produce copious amounts of snow. Overrunning conditions produced heavy snows from western Prince William Sound into southeastern portions of the Kenai Peninsula, especially near Seward, and from Seward into Turnagain Arm along and near the Alaska Railroad track system. In 72 hours, from Sunday through Wednesday evening, Whittier recorded 38 inches of new snow. From Monday morning to Wednesday morning, Seward received a whopping 46 inches of snow in the same period, virtually shutting down the town. Liquid water equivalents totalled 1.66 inches at the Seward ASOS from 9am Monday through 9am Wednesday. Girdwood recorded 21 inches of new snow at the Alyeska ski base...while 29 inches fell at the mountain top. Portage recorded over 2 feet of new snow...while Grandview (along the railroad corridor) reported 2 feet of snow in the 48 hour period from Sunday morning through Tuesday morning.

## **AKZ020**

### **Aleutian Islands**

<b>29</b>	<b>1500AST</b>	<b>0</b>	<b>0</b>	<b>High Wind (G48)</b>
<b>30</b>	<b>0800AST</b>			

A vigorous frontal low curved northwestward out of the northwest Pacific toward the Komandorskiye Islands...bringing southeast wind gusts to 55 mph to Shemya. Strongest gusts occurred just before frontal passage.

## AMERICAN SAMOA

## **ASZ002**

### **Tutuila**

<b>20</b>	<b>1200SST</b>	<b>0</b>	<b>0</b>	<b>Tropical Depression</b>
<b>21</b>	<b>0745SST</b>			

A stationary tropical depression was located to the west of the Samoan Islands with maximum wind gusts of 61 miles per hour early Sunday evening. High winds and heavy rains prompted the cancellation of inter-island flights between the two Samoas with the FAA Control tower at Tafuna reporting winds on Sunday averaging about 30 knots. When the gale wind warning was canceled, the tropical depression was located 200 miles to the west of Tutuila and moving westward away from the islands.

Three yachts in the harbor were pushed onto the rocks in the Pago area, a tree fell on a car in the Congo Hill area, another tree fell across the road in Leone and there was a minor landslide at Matuu/Faganeanea area. The high winds put debris on the main highway while the heavy rain flooded the streets.

No injuries had been reported.

## ARIZONA, Central and Northeast

### **Navajo County**

<b>5 W Snowflake</b>	<b>02</b>	<b>1445MST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Funnel Cloud</b>
		<b>1450MST</b>					

Snowflake police officers and members of the general public reported a funnel cloud.

## **AZZ017**

### **White Mountains**

<b>21</b>	<b>0658MST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G58)</b>
	<b>0703MST</b>					

The observer at the Show Low airport reported southerly wind gusts to 58 knots.

# Storm Data and Unusual Weather Phenomena

December 1998

December 1998									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

## ARIZONA, Northwest

**AZZ036**

**Lake Mead National Recreation Area**

**09 1250PST** **0 0** **High Wind (G50)**  
Strong north winds down the Colorado River Valley produced a 58 mph gust at the Laughlin-Bullhead Airport.

## ARIZONA, South

**AZZ019**

**Northern Greenlee**

**06 1700MST** **0 0** **Heavy Snow**  
**07 0200MST**  
Hannagan Meadow Lodge reported 8 inches of new snow..

## ARIZONA, Southwest

**AZZ023**

**Greater Phoenix Area**

**07 0800MST** **0 0** **Fog**  
Dense fog with visibility near zero was blamed on a 30-vehicle accident on I-10 near Sun Lakes.

**Maricopa County**

**Paradise Vly**

**15 0700MST** **1 3** **Lightning**  
Lightning struck the plywood roof of a home under construction. A worker was killed when the lightning bolt traveled down a wooden rafter and hit him in the head. Three other workers received minor injuries from this lightning. M20PH

## ARKANSAS, Central and North Central

**ARZ016-021>025-  
030>034-037>047-  
052>057-062>069**

**Independence - Johnson - Pope - Van Buren - Cleburne - Jackson - Logan - Conway - Faulkner - White -  
Woodruff - Scott - Yell - Perry - Polk - Montgomery - Garland - Saline - Pulaski - Lonoke - Prairie - Monroe -  
Pike - Clark - Hot Spring - Grant - Jefferson - Arkansas - Dallas - Cleveland - Lincoln - Desha - Ouachita -  
Calhoun - Bradley - Drew**

**22 2000CST** **1 0** **Ice Storm**  
**24 1800CST**

A major ice storm affected about the southern three-quarters of Arkansas as Christmas Day approached. Freezing rain and sleet developed across southern Arkansas during the evening of the 22nd...and spread north. Precipitation finally ended in southeast sections of the state during the early evening hours of the 24th. A tenth of an inch of ice or more was common south of Mena...Conway and Osceola, with up to eight tenths of an inch in parts of southeast Arkansas. Many businesses closed due to the ice, with most federal offices not open on the 23rd or 24th. The state's largest mall shut its doors for the night at 6pm on the 23rd. Driving became hazardous, and traffic slowed significantly. At one time, a drive along Interstate 30 from Malvern to Benton...a distance of only 19 miles...took an estimated 6 to 10 hours. This was mainly due to icing and numerous accidents. In one day, State Police investigated more than 400 accidents. One accident on Highway 38 in Lonoke County claimed the life of a young woman during the afternoon of the 23rd. The ice caused some power outages, with at least 2200 customers without power on the night of the 23rd. F24VE

**ARZ056**

**Jefferson**

**23 1200CST** **1 0** **Extreme Cold**

In addition to a major ice storm, much of Arkansas was affected by sub-freezing temperatures during the latter part of December. The cold weather apparently claimed the life of a man in Jefferson County who was found near some railroad tracks 3 miles east of Pine Bluff. M47OU

## ARKANSAS, East

**ARZ008>009-  
017>018-026-028-  
035>036-048>049-058**

**Randolph - Clay - Lawrence - Greene - Craighead - Mississippi - Cross - Crittenden - St. Francis - Lee -  
Phillips**

**23 0930CST** **0 0** **11K** **Ice Storm**  
**24 0300CST**

An ice storm moved through eastern Arkansas. Most areas saw between 1/4" and 1/2" of ice accumulation. A few trees were knocked down because of the ice.

## ARKANSAS, Northwest

**ARZ029**

**Sebastian**

**04 0000CST** **0 0** **Record Warmth**  
**05 2359CST**

The low temperature of 56 degrees Fahrenheit at the Fort Smith Regional Airport on December 4 broke the record for being the warmest low temperature on record for the date.

The high temperature of 79 degrees Fahrenheit at the Fort Smith Regional Airport on December 5 tied the record for being the warmest temperature on record for the date.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Property	Crops	Character of Storm
Killed	Injured									

## ARKANSAS, Northwest

**ARZ029**

**Sebastian**

**23 0000CST  
2359CST**

**0**

**0**

**Ice Storm**

A series of upper level disturbances moving across a shallow arctic air mass caused freezing rain to break out across central and southern Arkansas on the day before Christmas Eve. While the worst of the ice storm was further south in southern Arkansas and northern Louisiana, southern Sebastian County was on the northern fringe. Areas near Greenwood reported enough freezing rain to cause travel problems.

## ARKANSAS, Southeast

**ARZ074>075**

**Ashley - Chicot**

**22 2200CST  
24 2300CST**

**0**

**0**

**1.8M**

**Ice Storm**

## ARKANSAS, Southwest

**ARZ050>051-**

**Sevier - Howard - Little River - Hempstead - Nevada - Miller - Lafayette - Columbia - Union**

**059>061-070>073**

**22 1800CST  
24 2000CST**

**0**

**0**

**450K**

**Ice Storm**

A shallow arctic air mass spread southward across all of southwest Arkansas while low pressure formed in the Gulf of Mexico spreading warm moist air northward over the top of the arctic air mass. This resulted in widespread freezing rain, freezing drizzle, and sleet. Overall, accumulations of ice and sleet was generally below one inch. The ice accumulated mainly across exposed surfaces such as trees, powerlines, bridges, and overpasses. Numerous power outages, a few automobile accidents, and a few downed trees were the result of the ice storm.

## CALIFORNIA, Extreme Southeast

NONE REPORTED.

## CALIFORNIA, North Central

**CAZ068>069**

**Mt Shasta/Western Plumas County - West Slope Northern Sierra Nevada**

**03 0320PST  
1430PST**

**0**

**0**

**Heavy Snow**

Snow accumulations exceeded one foot above the 5000 foot level. Liquid equivalents measured up to 1.95 inches at Pacific House.

**CAZ015**

**Northern Sacramento Valley**

**04 0400PST  
0800PST**

**0**

**0**

**Extreme Cold**

A substantial freeze occurred as valley temperatures dropped into the middle to upper 20s. Both Redding and Red Bluff set/tied low temperature records. The low of 28 degrees in Redding tied a record that was originally set in the early 1900's.

**CAZ013>015-**

**063>064-066>069**

**Shasta Lake/North Shasta County - Burney Basin/Eastern Shasta County - Northern Sacramento Valley - Mountains Southwest Shasta County To Northern Lake County - Clear Lake/Southern Lake County - Northeast Foothills/Sacramento Valley - Motherlode/Camptownville To Goverland - Mt Shasta/Western Plumas County - West Slope Northern Sierra Nevada**

**05 1530PST  
06 0400PST**

**0**

**0**

**300K**

**Winter Storm**

A cold Pacific storm produced snow across much of the Northern Sierra Nevada and Southern Cascades. Wet snow accumulated across the Northern Sacramento Valley with six inches just north of the city of Redding and two inches at the airport. Trace amounts to 1/2" fell across the Red Bluff area. The heavy wet snow downed power lines and caused more than a dozen valley accidents including a 30 vehicle pile up south of Castella. Interstate 5 was partially closed between 1545 and 2145 PST.

**CAZ015>019**

**Northern Sacramento Valley - Central Sacramento Valley - Southern Sacramento Valley - Carquinez Strait And Delta - Northern San Joaquin Valley**

**06 0300PST  
07 0900PST**

**0**

**0**

**Extreme Cold**

The second Arctic blast in a five day period produced well below normal temperatures. The cold air not only affected the Northern Sacramento Valley, but also seeped south into the Northern San Joaquin Valley. Record low temperatures as well as low maximum temperatures were recorded at Redding Airport, Sacramento Executive Airport, and Stockton Airport. Specifically on the 6th, Redding reported a low of 25 degrees, Red Bluff 28, Chico 27, Sacramento 27, Vacaville 28, and Stockton 29.

**CAZ019**

**Northern San Joaquin Valley**

**11 0430PST  
0945PST**

**2**

**2**

**40K**

**Fog**

Dense fog resulted in a multi-fatal accident 15 miles northeast of Stockton on Highway 88 at about 0410 PST. M36VE, F25VE

# Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	December 1998	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Persons Injured	Property Damage	Crops	Character of Storm
<b>CALIFORNIA, North Central</b>									
CAZ017	<b>Southern Sacramento Valley</b>								
	18	0319PST 1117PST			1	10	500K		Fog
Dense fog resulted in a 38 vehicle pileup 10 miles northwest of downtown Sacramento on Interstate 5 at 0820 PST. The crash involved 26 automobiles, 10 tractor trailers, and 2 motor homes. Interstate 5 was closed for more than 10 hours in both directions. F34VE									
CAZ015>019	<b>Northern Sacramento Valley - Central Sacramento Valley - Southern Sacramento Valley - Carquinez Strait And Delta - Northern San Joaquin Valley</b>								
	19 29	0300PST 1100PST			0	0	2.4M		Extreme Cold
The third Arctic airmass of the month to spread into the Central California interior was the coldest of the three and produced large amounts of crop damage/loss. Low temperatures dropped below freezing for 7 consecutive days in Redding with 21 degrees being the lowest recorded temperature. Red Bluff experienced 9 consecutive days with the low temperature at or below freezing. The lowest temperature recorded at Red Bluff was also 21 degrees. Downtown Sacramento experienced 6 consecutive days with low temperatures at or below freezing. The lowest temperature recorded downtown was 26 degrees. Stockton experienced 11 consecutive days with low temperatures at or below freezing. The lowest temperature recorded in Stockton was 20 degrees.									
<b>CALIFORNIA, Northeast</b>									
CAZ070	<b>Surprise Valley</b>								
	02 03	1910PST 0710PST			0	0	0		Heavy Snow
4 inches of snow in 12 hours reported 6 miles north of Cedarville, elevation 4800 feet.									
CAZ071	<b>Lassen/Eastern Plumas/Eastern Sierra</b>								
	03	0025PST 1225PST			0	0	0		Heavy Snow
Estimate of 10 inches of new snow in Susanville, elevation 4200 feet.									
CAZ071	<b>Lassen/Eastern Plumas/Eastern Sierra</b>								
	03	0300PST 0735PST			0	0	0		Heavy Snow
5 inches of snow in 4 hours and 35 minutes in Pittville, elevation 3300feet.									
CAZ071	<b>Lassen/Eastern Plumas/Eastern Sierra</b>								
	03	0720PST 2120PST			0	0	0		Heavy Snow
10 inches of snow in 14 hour period at Janesville, elevation 4236 feet.									
CAZ071	<b>Lassen/Eastern Plumas/Eastern Sierra</b>								
	03	0800PST 1200PST			0	0	0		Heavy Snow
5 inches of snow in 4 hours in Janesville,elevation 4236 feet.									
CAZ072	<b>Greater Lake Tahoe Area</b>								
	03 04	0846PST 0846PST			0	0	0		Heavy Snow
13 inches of snow in 24 hours at Tahoe City, elevation 6300 feet.									
CAZ073	<b>Mono</b>								
	03	1430PST 2030PST			0	0	0		Heavy Snow
6 inches of snow in 6 hours at Mammoth Lakes, elevation 7800 feet.									
CAZ071	<b>Lassen/Eastern Plumas/Eastern Sierra</b>								
	05	1620PST 1920PST			0	0	0		Heavy Snow
5.5 inches of snow in Pittville in 3 hours, elevation 3300 feet.									
CAZ072	<b>Greater Lake Tahoe Area</b>								
	05	1750PST 2250PST			0	0	0		Heavy Snow
10 inches of snow on top of Donner Summit in 5 hours, elevation 7300 feet.									
CAZ073	<b>Mono</b>								
	19	1100PST			0	0	0		High Wind (G70)
Peak wind gust of 80 mph reported at Aspen Springs Ranch, 3 miles south of Crowley Lake.									

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## CALIFORNIA, Northeast

### CAZ071 Lassen/Eastern Plumas/Eastern Sierra

20 0600PST 1400PST 0 0 0 Heavy Snow

6 inches of snow in 8 hours at Doyle, elevation 4267 feet.

## CALIFORNIA, Northwest

### Del Norte County

Central Portion 02 0700PST 03 0400PST 0 0 Urban/Sml Stream Fld

### Humboldt County

Countywide 02 0700PST 03 0400PST 0 0 Urban/Sml Stream Fld

Heavy rain caused flooding along many small streams in Northern/Central Humboldt County and Central Del Norte County. Some streams involved include: Noisy Creek, Jacoby Creek and Elk River. Highway 101 near Sand Mine Road and Highway 197 northeast of Crescent City were closed due to flooding.

### CAZ003>004-076 North Coast Interior - Upper Trinity River - Mendocino Interior

05 1030PST 0 0 Heavy Snow

Five to seven inches of snow fell above 2000 feet. Some specific amounts: Kettenpom 6", Weaverville 7" and near Bridgeville 6".

### Mendocino County

1.2 SSW Ft Bragg to .8 S Ft Bragg 05 1557PST 1.7 50 0 0 Tornado (F1)

Tornado touched down near the mouth of the Noyo River damaging a mobile home and uprooting trees. The tornado crossed Highway 1 and damaged the roof of a motel and a courthouse. It uprooted additional trees at the end of its path across the street from a hospital emergency room.

### CAZ003>004-076 North Coast Interior - Upper Trinity River - Mendocino Interior

17 0500PST 0900PST 0 0 Fog

Visibility across Southern Trinity, Southern Humboldt and North Central Mendocino Counties ranged from zero to 1/4 mile.

### CAZ001>004-076 Redwood Coast - Mendocino Coast - North Coast Interior - Upper Trinity River - Mendocino Interior

19 1630PST 20 0530PST 0 0 Heavy Snow

Six to eight inches of snow fell above 500 feet with snow falling all the way down to sea level. The greatest snow depths were in Central Trinity, Southern Humboldt and Northern Mendocino Counties. Highway 101 was closed from Fortuna to Willits (90 miles) for much of the night of the 19th.

### CAZ001>004-076 Redwood Coast - Mendocino Coast - North Coast Interior - Upper Trinity River - Mendocino Interior

21 2300PST 22 0800PST 0 0 Extreme Cold

Minimum temperatures dropped below zero in many interior valleys and into the teens on the coast. Many record minimum temperatures were set. Minimal agricultural damage but many buildings suffered water damage from broken pipes.

## CALIFORNIA, South Central

### CAZ020 Central San Joaquin Valley

10 0600PST 1000PST 0 4 50K Fog

Dense fog with visibilities of only 100 feet contributed to a six-vehicle pileup in Madera County. The accident was at 0640 PST east of Madera in rural Madera County. Other areas of concern were black ice formation in Merced, Mariposa, Madera, and Fresno Counties due to temperatures below the freezing mark and the moisture within the fog.

### CAZ020>021 Central San Joaquin Valley - Southern San Joaquin Valley

20 0030PST 27 0800PST 0 0 555M Extreme Cold

On December 19th an arctic airmass began moving over Central California. The resulting cold air pool from advection and radiational cooling in the lowest levels of the atmosphere led to a devastating freeze to crops, especially citrus, in the Central and Southern San Joaquin Valley from December 20th through 27th. Estimates of direct crop loss reached \$555M for the Central and Southern San Joaquin Valley with an indirect economic loss estimated at \$2.5B to local area economies. The largest percentage of area crop losses were to lemons and oranges but several other unharvested fruit and vegetable crops, including avocados and broccoli, also suffered widespread damage. Mornings of freezing temperatures lasted from the 20th through the 30th but the coldest mornings of concern to agriculture generally ended on the 27th. On the morning of the 23rd, for example, minimum temperatures dropped to the 16-24 deg F. range with time durations less than 28 deg F. in excess of 16 hours in many locations.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## CALIFORNIA, South Central

Fresno had a record low maximum temperature of only 34 deg F. on the 21st eclipsing the old record of 35 deg F. set in 1908. A record low maximum temperature was seen in Bakersfield on the 22nd with the mercury only reaching 34 deg F. and only 35 deg F. for Fresno. Subsequently a record low temperature was tied in Bakersfield on the morning of the 23rd with a 19 deg F. reading. This freeze was eerily reminiscent of a similar event during the same time period in December of 1990.

CAZ022

### **Southern Sierra Nevada-Yosemite National Park To Kings Canyon**

20	1300PST	0	0	10K	Heavy Snow
	1730PST				

CAZ020

### **Central San Joaquin Valley**

20	2000PST	2	0	1M	Ice Storm
21	0900PST				

M18VE, F60VE

In conjunction with the freeze event affecting area agriculture, the combination of moisture and unusually cold air led to the development of black ice on Central San Joaquin Valley roadways. Two fatalities occurred during the evening hours of the 20th in the city of Fresno due to black ice on roadways. In addition over 200 accidents were reported in the Fresno/Madera County area. Some additional vehicular accidents were also reported in Merced and Mariposa Counties due to black ice, including stretches of Highways 59, 99, and 152 on the San Joaquin Valley floor. Snow fell on the San Joaquin Valley floor very early in the morning of the 20th although only recorded as a trace at NWS observing sites beginning around 0700 PST. From the late morning hours until 17:30 PST on the 20th, 8 inches to a foot of new snow fell in the Sierra Nevada Foothill town of Mariposa at approximately the 3000-foot elevation. Over 6,000 local power utility customers went without power the night of the 20th due to the snowfall.

CAZ021

### **Southern San Joaquin Valley**

29	0600PST	0	10	100K	Fog
	1000PST				

Dense fog formation led to an 8-vehicle pileup on Highway 198 near Lemoore. Visibilities were near zero around Lemoore and less than 100 feet in several other areas along Highway 198 in Kings County. There were several other accidents in Kings County along Highway 41 and other rural roads during the morning dense fog episode.

## CALIFORNIA, Southeast

CAZ026

### **Owens Valley**

19	1100PST	0	0	10K	High Wind (G70)
	1400PST				

High winds occurred for a few hours in the Owens Valley as an arctic front moved through the region. An automated wind sensor, 12 miles west of Bishop Airport, recorded a gust of 81 mph at 1:00 pm PST. The same sensor also recorded numerous gusts over 60 mph between 11:00 am and 2:00 pm. Highway 395 was closed for about two hours just north of Bishop due to zero visibility in blowing dust. A Bishop bank sign was also blown down and damaged.

CAZ026

### **Owens Valley**

22	0100PST	0	0	75K	Extreme Cold
	0700PST				

Unusually cold temperatures caused water pipes to freeze and break in several Bishop homes. The fire department responded to several calls and used vacuums and hoses to pump water from residences and Bishop's Union High School.

## CALIFORNIA, Southwest

### **Orange County**

15 N Santa Ana to 3 S San Juan Capistrano	01	0230PST 2030PST	0	0	140K	Heavy Rain
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Heavy rain resulted in dozens of traffic accidents on Orange County freeways and city roads. The California Highway Patrol Traffic Management Center reported a 30 percent increase in the accidents compared to dry days. Rainfall amounts ranged from a quarter to one inch. No flooding was reported.

### **Orange County**

2.5 WNW Newport Beach to 2.1 WNW Newport Beach	01	0600PST 0830PST	0	0	2.5K	Storm Surge
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### **San Diego County**

.5 NW Ocean Beach	01 04	0600PST 1000PST	0	0	2.5K	Storm Surge
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### **San Diego County**

1 W Solana Beach to .5 S Cardiff By The Sea	01 05	0600PST 1100PST	0	0	10K	Storm Surge
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# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## CALIFORNIA, Southwest

### San Diego County

**1.5 SW Imperial Beach 02 0730PST 0900PST 0 0 1K Storm Surge**

The combination of spring high tides and heavy surf caused minor beach erosion , damage , and flooding of low lying coastal roads. Rocks and other debris were deposited each morning onto Highway 101 and in parking lots of restaurants located on the coastal strip between Cardiff and Solana Beach. Streets were flooded in Newport Beach on the morning of 12/01/98, but a three foot sand berm erected that afternoon prevented further flooding. Similar preventive measures were taken along the beaches of Del Mar and no reports of flooding or damage were received from there. In Ocean Beach, waves washed over the sea wall and into the parking lots the first few days, but a sand berm was then erected and no further flooding was reported. In Imperial Beach, rocks and other debris broke the front window of a condominium with water damage to the furnishings.

### CAZ055>056-058-060 San Bernardino County Mountains - Riverside County Mountains - San Diego County Mountains - Apple And Yucca Valleys

**04 0700PST 0 0 Heavy Snow**  
**06 0700PST**

This was the first heavy snow storm for late autumn 1998. The snow occurred in two episodes, the first beginning the late evening of Dec. 4, and the second beginning in the early morning hours of Dec. 5. Total snowfall at the 6000 foot elevation was 9 to 10 inches. In the passes 4 to 6 inches was reported. The high valleys to the north of the San Bernardino Mountains received one to three inches of snow. As a result 70 to 90 percent of the primary roads were closed, and nearly 100 percent of the secondary roads. Highway crews used 22 person days of overtime to clear the roads in San Bernardino county alone. Several traffic accidents in Hesperia were also the result of the snow.

### Orange County

**San Clemente 04 2330PST 0 0 Hail (0.75)**

### San Diego County

**2 SW Imperial Beach 05 0830PST 0 0 Funnel Cloud**

### Orange County

**9 WSW Garden Grove to 3 NW Garden Grove 06 0424PST 0430PST 0 0 450K Thunderstorm Wind (G65)**

A line of strong thunderstorms moved across Orange County during the early morning hours of Dec. 6. Numerous trees were blown, falling on houses, cars, and power lines. Shingles were ripped off roofs and fences, walls, and street signs blown over. Three houses were declared uninhabitable, 75 had minor damage, 11 automobiles were crushed, and power outages affected 18,200 customers. Communities affected included: Seal Beach, Los Alamitos, Rossmore, Cypress, Tustin, Santa Ana, and Garden Grove.

### San Diego County

**4 N San Diego to 2 N Campo 06 0719PST 0809PST 0 0 5K Thunderstorm Wind (G50)**

A line of thunderstorms moved east across San Diego County knocking down trees, freeway signs, and causing power outages. Communities affected by wind damage included: Mission Valley, La Mesa, Cameron Corners.

### CAZ042-048>050-057 Orange County Coastal Plain - San Bernardino County Valley/The Inland Empire - Riverside County Valley/The Inland Empire - San Diego County Valleys - Santa Ana Mountains And Foothills

**09 0330PST 0 24 1.1M High Wind (G81)**  
**2230PST**

### CAZ048 San Bernardino County Valley/The Inland Empire

**09 0624PST 0 0 Dust Storm**  
**1853PST**

### Riverside County

**Riverside 09 0830PST 0 0 Wild/Forest Fire**  
**1000PST**

### Orange County

**Fountain Vly to Newport Beach 09 1240PST 0 0 25K Wild/Forest Fire**  
**1840PST**

The strongest Santa Ana wind event in two years affected the area, severely disrupting transportation, power, and daily activities. Broken trees and power poles were common throughout the area and power was knocked out to 180,000 customers. Downed power lines also started several wild fires, damaging one house. Seventeen trucks were blown over along Interstate 15 and Highway 60. Blowing dust forced the closure of the Ontario International Airport for several hours. Seven students were knocked down and injured at the California State University in San Bernardino. Trees also fell on two passing motorists in the Fontana area.

# Storm Data and Unusual Weather Phenomena

									December 1998
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b><u>CALIFORNIA, Southwest</u></b>									
<b>CAZ049</b>	<b>Riverside County Valley/The Inland Empire</b>								
	<b>15</b>	<b>0345PST 0403PST</b>			<b>0</b>	<b>0</b>	<b>50K</b>		<b>High Wind (G63)</b>
	Strong winds broke 30 power poles in the Beaumont area.								
<b>CAZ043</b>	<b>San Diego County Coasts</b>								
	<b>15</b>	<b>1211PST 1341PST</b>			<b>0</b>	<b>0</b>	<b>150K</b>		<b>High Wind (G40)</b>
	Strong winds gusting across San Diego Bay and the nearshore coastal waters caused two sail boats to be blown aground and capsized a 27 foot commercial fishing vessel. Four other boats required assistance from the Coast Guard. Mariners reported wind gusts near 40 knots during the period.								
<b>CAZ058</b>	<b>San Diego County Mountains</b>								
	<b>21</b>	<b>0648PST 1200PST</b>			<b>0</b>	<b>0</b>	<b>10K</b>		<b>High Wind (G53)</b>
	IN Warner Springs, an NWS spotter measured sustained winds 40 mph with gusts to 60 mph for a four hour period. Windows were broken and a green house destroyed. Flight Operations at the Warner Springs Glider Port were halted due to east winds near 40 mph.								
<b>CAZ048</b>	<b>San Bernardino County Valley/The Inland Empire</b>								
	<b>21</b>	<b>0720PST 0853PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G58)</b>
	Spotter measured wind gust to 67 mph.								
<b><u>CALIFORNIA, Upper</u></b>									
<b>CAZ011</b>	<b>Siskiyou County</b>								
	<b>05</b>	<b>1623PST</b>			<b>0</b>	<b>0</b>			<b>Winter Storm</b>
	Yreka spotter reported winds gusting to 60 mph.								
	A winter storm warning was issued on 12/05 at 0253 PST for Oregon zones 003, 007, 008, and 012 above 2500 feet. The warning was extended to California zone 011 above 3000 feet at 0330 PST. All warnings were cancelled on 12/06 at 0306 PST.								
<b><u>CALIFORNIA, West South Central</u></b>									
<b>CAZ034&gt;035- 039&gt;041</b>	<b>San Luis Obispo County Central Coast - Santa Barbara County Central Coast - Santa Barbara County South Coast - Ventura County Coast - Los Angeles County Coasts Including Downtown Los Angeles</b>								
	<b>01 03</b>	<b>0245PST 1515PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Surf</b>
	Large northwest swell, generated by storms in the Northern Pacific, produced heavy surf along the Central and Southern California coasts. Widespread surf of 7 to 10 feet with local sets to 12 feet was reported. The heavy surf combined with high astronomical tides to produce some minor street flooding near Oxnard Beach.								
<b>CAZ034&gt;035</b>	<b>San Luis Obispo County Central Coast - Santa Barbara County Central Coast</b>								
	<b>04 05</b>	<b>0100PST 1800PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Surf</b>
	Another large northwest swell brought heavy surf to the Central California coast. Widespread surf of 8 to 10 feet with local sets to 12 feet was reported.								
<b>CAZ041</b>	<b>Los Angeles County Coasts Including Downtown Los Angeles</b>								
	<b>06</b>	<b>0410PST 0430PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G43)</b>
	Strong northwest winds, associated with a fast-moving cold front, produced significant damage in the community of Long Beach. Six homes lost parts of their roofs while two cars were crushed by downed trees.								
<b>CAZ034&gt;035</b>	<b>San Luis Obispo County Central Coast - Santa Barbara County Central Coast</b>								
	<b>08 09</b>	<b>2100PST 2000PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Surf</b>
	Large northwest swell produced heavy surf along the Central California coast. Widespread surf of 8 to 10 feet with local sets to 12 feet was reported.								
<b>CAZ040&gt;041- 044&gt;047-053&gt;054</b>	<b>Ventura County Coast - Los Angeles County Coasts Including Downtown Los Angeles - Ventura County Interior Valleys - Ventura County Coastal Valleys - Santa Monica Mountains Recreation Area - Los Angeles County Valleys - Ventura County Mountains - Los Angeles County Mountains Excluding The Santa Monica Range</b>								
	<b>09 10</b>	<b>0300PST 1600PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G66)</b>

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## CALIFORNIA, West South Central

### Los Angeles County

**Glendale**      **09 1530PST**      **0**      **0**      **Wild/Forest Fire**  
**10 0200PST**

Powerful Santa Ana winds developed across Southern California. Northeast winds gusted up to 76 mph in the mountains and 69 mph across the coasts and valleys. Numerous power lines were knocked down, producing many power outages. In Glendale, the strong winds fueled a 60 acre brushfire that was ignited by downed power lines.

### CAZ034>035

#### **San Luis Obispo County Central Coast - Santa Barbara County Central Coast**

**11 1505PST**      **0**      **0**      **Heavy Surf**  
**12 0725PST**

Large northwest swell produced heavy surf along the Central California coast. Widespread surf of 8 to 10 feet with local sets to 12 feet was reported.

### Los Angeles County

**Countywide**      **21 2200PST**      **0**      **0**      **200K**      **Freeze**  
**24 0800PST**

### San Luis Obispo County

**Countywide**      **21 2200PST**      **0**      **0**      **5.4M**      **Freeze**  
**24 0800PST**

### Santa Barbara County

**Countywide**      **21 2200PST**      **0**      **0**      **3.5M**      **Freeze**  
**24 0800PST**

### Ventura County

**Countywide**      **21 2200PST**      **0**      **0**      **74.3M**      **Freeze**  
**24 0800PST**

An unseasonably cold airmass produced a three-night period of sub-freezing temperatures across Central and Southern California. Agricultural interests suffered heavy crop losses. The California Department of Food and Agriculture reported over \$83 million in crop losses across the four-county area.

## CALIFORNIA, Western

### Sonoma County

**Santa Rosa**      **05 1820PST**      **1.5**      **150**      **0**      **0**      **1M**      **Tornado (F1)**  
**1825PST**

### Contra Costa County

**Richmond**      **05 1930PST**      **1.5**      **150**      **0**      **0**      **200K**      **Tornado (F0)**  
**1934PST**

### Santa Cruz County

**Santa Cruz**      **05 2030PST**      **1**      **100**      **0**      **0**      **50K**      **Tornado (F0)**  
**2032PST**

### CAZ007

#### **Alameda / Contra Costa Counties**

**16 0033PST**      **0**      **0**      **50K**      **High Wind (G61)**  
**0833PST**

## COLORADO, Central and Northeast

### COZ035>036-038>040

#### **Northern Front Range Foothills/Upper Laramie And Cache La Poudre River Basins - Southern Front Range Foothills/Clear Creek Basin - Eastern Larimer And Northwestern Weld Counties - Eastern Boulder County/Boulder And Vicinity - Denver Metropolitan Area**

**09 0530MST**      **0**      **0**      **0**      **Heavy Snow**  
**2330MST**

Locations in and near the Front Range Foothills received the first significant snowfall in more than a month. The upslope snow event deposited up 17 inches of snow in the foothills. Along the Urban Corridor, west of Interstate 25, amounts ranged from 4 to 8 inches.

Some of the more impressive snowfall totals included: 17 inches at Crescent Park, 16 inches at Coal Creek Canyon and Tiny Town, 14 inches at Chief Hosa, Evergreen and Gennese, 13 inches at Conifer, 12 inches at Nederland, 11 inches at Eldorado Canyon and Rist Canyon, 10 inches near Buckhorn Mountain, 9 inches at Allenspark, 4 miles west of Boulder and Hohnholz Ranch, 8 inches at Boulder, 7 inches at Broomfield and Golden with 6 inches reported 2 miles north of Loveland.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Property	Crops	Character of Storm
Killed	Injured									

## **COLORADO, Central and Northeast**

### **COZ035-038-042-050 Northern Front Range Foothills/Upper Laramie And Cache La Poudre River Basins - Eastern Larimer And Northwestern Weld Counties - Northeastern Weld County - Sedgwick And Phillips Counties**

**18 1730MST 0 0 0 Winter Storm**  
**24 2230MST**

Whiteout conditions occurred near the Wyoming border as gusty winds to 40 mph combined with heavy, relatively stationary, bands of snow. Portions of U.S. Highways 85 and 287 were closed due to the treacherous weather conditions. Interstate 25, from Wellington to the Wyoming State Line was also closed for a time due to numerous accidents. The blinding snowstorm made it difficult for the rescue crews to reach some of the accident victims.

Snowfall totals included: 12 inches 21 miles north of New Raymer, 9 inches 6 miles south of New Raymer, 8 inches 7 miles east-northeast of Virginia Dale, 7 inches 9 miles northwest of Livermore, 6 inches at Hohnholz Ranch and 9 miles west-southwest of Rustic with 5 inches reported 4 miles east of Haxtun and at Hereford.

### **COZ040**

#### **Denver Metropolitan Area**

**18 1800MST 3 15 0 Extreme Cold**  
**24 1800MST**

An Arctic air mass settled in over northeastern Colorado dropping overnight temperatures well below zero for 6 consecutive days. Overnight temperatures bottomed out at 19 degrees below zero on the morning of the 22nd. At least 15 people, mostly homeless, were treated for hypothermia at area hospitals. The bitter cold weather was responsible, either directly or indirectly, for at least 5 fatalities. Three of the victims died directly from exposure. The cold weather also caused intermittent power outages. Following the cold snap, thawing water pipes cracked and burst in several homes and business causing extensive damage. No estimate of the damage, however, was available.

M51OU, M53OU, F76OU

### **COZ030-033-035**

#### **North Park - Rabbit Ears & Medicine Bow Ranges/Rocky Mountain National Park - Northern Front Range Foothills/Upper Laramie And Cache La Poudre River Basins**

**19 2100MST 0 0 0 Winter Storm**  
**20 0800MST**

An upper level jet stream over northern Colorado produced bands of heavy snow. Snowfall totals included: 10 inches at Hohnholz Ranch, 9 inches, 9 miles west-southwest of Rustic, 8 inches at Rand and 7 miles east-northeast of Virginia Dale, 7 inches, 9 miles northwest of Livermore and 6 inches at Walden.

### **COZ033**

#### **Rabbit Ears & Medicine Bow Ranges/Rocky Mountain National Park**

**20 0500MST 0 0 0 Winter Storm**  
**21 0500MST**

More heavy snow occurred in portions of the northern mountains. Snowfall totals ranged from 8 to 12 inches at Bear Lake, Joe Wright, Lake Irene and Willow Creek Pass.

### **COZ035**

#### **Northern Front Range Foothills/Upper Laramie And Cache La Poudre River Basins**

**26 0400MST 0 0 0 High Wind (G90)**  
**1400MST**

Intense, but localized, downslope winds developed near Wondervu as frequent gusts to 100 mph (87 kts) were reported. The peak wind gust during the event was 104 mph (90 kts).

### **COZ034>036-038**

#### **Summit County/Mosquito Range/Indian Peaks - Northern Front Range Foothills/Upper Laramie And Cache La Poudre River Basins - Southern Front Range Foothills/Clear Creek Basin - Eastern Larimer And Northwestern Weld Counties**

**27 2255MST 0 0 0 High Wind (G99)**  
**28 1600MST**

Damaging downslope winds formed in and near the Front Range Foothills. Peak wind gusts ranged anywhere from 71 to 114 mph (99 kts). Numerous trees were reportedly blown down in the Coal Creek Canyon area and near Gross Reservoir. Power lines were also downed which resulted in scattered outages. A roof of a home was also extensively damaged at Carter Lake. Along Interstate 25, north of Fort Collins, strong cross-winds blew a semi-trailer off the highway. There were no injuries in the mishap.

Peak wind reports included: 114 mph (99 kts) at Wondervu, 110 mph (96 kts) above 12000 ft at Breckenridge Ski Area, 96 mph (83 kts) at Carter Lake, 92 mph (80 kts) at Golden Gate Canyon, 88 mph (76 kts) at Coal Creek Canyon, 83 mph (72 kts) 4 miles south of Livermore, 79 mph (69 kts) at Red Feather Lakes and 8 miles west of Conifer, 74 mph (64 kts) 1 mile east of Buckhorn Mountain and 71 mph (61 kts) at Estes Park and 5 miles west-northwest of Wellington.

### **COZ035>036-038-040 Northern Front Range Foothills/Upper Laramie And Cache La Poudre River Basins - Southern Front Range Foothills/Clear Creek Basin - Eastern Larimer And Northwestern Weld Counties - Denver Metropolitan Area**

**30 0130MST 0 0 0 High Wind (G78)**  
**1000MST**

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property		

December 1998

## COLORADO, Central and Northeast

High winds continue to buffet locations in and near the Front Range Foothills. Near Evergreen, a 100-foot blue spruce crashed down on to the roof of a home, splitting the corrugated metal roof in half. Fortunately the tree, which measured 10 feet in circumference, only penetrated the home's interior in a few places. In Boulder, high winds caused a power outage in the Pinebrook Hills and Boulder Heights subdivisions. Five hundred residents were without electricity for about 6 hours.

Peak wind reports included: 90 mph (78 kts) at Carter Lake and Wondervu, 88 mph (76 kts) at the Rocky Flats Environmental Test Facility, 85 mph (74 kts) 4 miles south of Livermore, 83 mph (72 kts) 5 miles west of Conifer and 82 mph (71 kts) at Blue Mountain.

## COLORADO, East Central

NONE REPORTED.

## COLORADO, South Central and Southeast

COZ061

**Eastern San Juan Mountains**

**05 0300MST 1600MST 0 0 Heavy Snow**

A strong weather system brought a favorable southwest airflow over the Eastern San Juan mountains. Snow accumulations ranged from 4 to 8 inches in Mineral and Rio Grande counties from early morning through most of the afternoon. Nearly 8 inches of snow fell on Wolf Creek Pass, and 4 to 6 inches occurred in and around South Fork. As the weather system moved across the rest of southern Colorado, cold air surged south over the eastern plains. A brief burst of snowfall brought 1 to 4 inches of snow from the Colorado Springs area through Pueblo and into the Wet mountains.

COZ066-074>075

**Southern Sangre De Cristo Mountains - Upper Huerfano River Basin/Walsenburg And Vicinity - Upper Purgatoire River Basin/Trinidad And Vicinity**

**06 2000MST 07 1100MST 0 0 Heavy Snow**

A strong weather disturbance moved across northern New Mexico from the evening of the 6th through much of the morning of the 7th. Heavy snow fell, for a time, in the southern Sangre De Cristo mountains and adjacent foothills. Around 5 inches of snow accumulated in Cuchara and a few miles west of Aguilar, as well as the Spanish Peaks. Accumulations of 1 to 3 inches occurred in the Walsenburg area, Wet mountains, and portions of the southeast plains.

COZ066-070-072-074

**Southern Sangre De Cristo Mountains - Wet Mountains - Northern El Paso County/Monument Ridge - Upper Huerfano River Basin/Walsenburg And Vicinity**

**09 0700MST 10 0800MST 0 0 Heavy Snow**

A surge of cold air and accompanying snow moved south through the eastern plains and adjacent mountains from the morning of the 9th through the morning of the 10th. Monument Ridge, north of Colorado Springs, picked up from 4 to 7 inches of snow, in and around Monument, Palmer Lake, and Black Forest. Four to 7 inches of snow fell, mainly on the east facing slopes of the Wet Mountains in the Beulah and Rye areas, and in the Walsenburg area. Cuchara, in the southern Sangre De Cristo mountains, tallied 17.5 inches of snow. In Teller county, western El Paso county, including western Colorado Springs, Fremont county, and the Trinidad area, 1 to 4 inches of snow accumulated.

COZ060>061-065>067-070

**La Garita Mountains - Eastern San Juan Mountains - Northern Sangre De Cristo Mountains - Southern Sangre De Cristo Mountains - Teller County/Rampart Range/Pikes Peak - Wet Mountains**

**20 1500MST 21 1000MST 0 0 Winter Storm**

A very cold arctic airmass invaded the eastern plains early Saturday morning, the 19th. A prolonged period of light snow occurred through the afternoon of the 20th. Snow amounts east of the mountains ranged from 1 to 5 inches. Then a strong weather system moved quickly across northern New Mexico from the afternoon of the 20th through late morning of the 21st. Heavy snow fell mainly in the higher elevations. The summit of Wolf Creek Pass picked up around 12 inches of snow. In the La Garita, Sangre de Cristos, Rampart Range, and Wet mountains many locations tallied more than 4 inches of snow. Four inches of snow fell in Victor in Teller county, in Wetmore, Westcliffe, and Rye. Beulah had 5 inches of accumulation. In lower elevations and on slopes less favorable for heavy snow 1 to 4 inches of snow fell. Very cold arctic air persisted east of the mountains in the wake of the storm.

COZ067

**Teller County/Rampart Range/Pikes Peak**

**28 0600MST 1500MST 0 0 High Wind (G62)**

A strong jet stream brought high winds to the mountains in Teller county and western El Paso county. Measured winds occasionally gusted to just over 70 mph above 9000 feet west of the Air Force Academy.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## COLORADO, West

**COZ004>005-009-012-017>019** Elkhead And Park Mountains/Flat Tops/White River Plateau - Upper Yampa River Basin/Steamboat Springs And Vicinity - Grand And Battlement Mesas - West Elk And Sawatch Mountains/Taylor Park - Uncompahgre Plateau - Northwestern San Juan Mountains - Southwestern San Juan Mountains

05	1200MST	0	0	Heavy Snow
06	2200MST			

A moist Pacific trough produced 6 to 12 inches of snow in most mountain areas of western Colorado. The heaviest reported accumulation was 14 inches at Steamboat Springs Ski Area.

**COZ001>012-015-017>019** Lower Yampa River Basin/Rangely And Vicinity - Central Yampa River Basin/Craig-Hayden And Vicinity - Roan And Tavaputs Plateaus - Elkhead And Park Mountains/Flat Tops/White River Plateau - Upper Yampa River Basin/Steamboat Springs And Vicinity - Grand Valley/Grand Junction And Vicinity - Debeque Rifle Glenwood Springs Corridor - Central Colorado River Basin/Eagle And Vicinity - Grand And Battlement Mesas - Gore And Elk Mountains/Central Mountain Valleys/Aspen And Vicinity - Central Gunnison And Uncompahgre River Basin/Montrose And Vicinity - West Elk And Sawatch Mountains/Taylor Park - Leadville And Vicinity - Uncompahgre Plateau - Northwestern San Juan Mountains - Southwestern San Juan Mountains

19	0500MST	0	0	Winter Storm
21	1000MST			

An upper trough and an Arctic air mass joined forces to produce heavy snow and blizzard-like conditions across most of western Colorado. The storm helped to break a dry period, especially in the mountains where the ski areas had been suffering from a lack of snow. The storm also wreaked havoc for travelers, with hundreds of accidents and many road closures. 12 to 18 inches of new snow fell in the mountains, while lower valley elevations generally received 6 to 12 inches. Some of the heavier snow totals included 33 inches on Molas Pass, 22 inches on the Grand Mesa, 21 inches at Telluride Ski Area, 19 inches at Sunlight Ski Area as well as the Flat Tops Mountains, and 18 inches on Douglas Pass. Some of the biggest snowfall amounts in the lower valleys included 15 inches at Montrose, 15 inches at Meeker, 15 inches at El Jebel, 14 inches just north of Craig, and 9 inches in the Redlands of Grand Junction. Windy conditions accompanied the snow, especially in the mountains where snow drifts of 6 to 8 feet deep occurred. Some peak wind gusts included 98 MPH on Mount Abrams, 94 MPH on the top of Telluride Ski Area, and 89 MPH over Red Mountain Pass.

**COZ005** Upper Yampa River Basin/Steamboat Springs And Vicinity

23	0300MST	0	0	0.50K	Flood
	1500MST				

Extremely cold weather froze the Bear River from the bottom up, causing the water in the river to rise out of its banks. Two streets in downtown Yampa were flooded. Heavy equipment was used to break up the ice and avert a more serious problem. Only minor flood damage was reported.

## CONNECTICUT, Northeast

**CTZ002>004** Hartford - Tolland - Windham

01	0800EST	0	0	Strong Winds
	1800EST			

Strong west to northwest winds occurred in the wake of a cold front associated with an intense low pressure system moving northward through Quebec. Peak wind gusts were generally in the range of 40 to 50 mph. A peak gust to 47 mph was reported at Bradley International Airport in Windsor Locks. There were no reports of damage.

**CTZ002** Hartford

07	1200EST	0	0	Record Warmth
	1500EST			

Unseasonably warm temperatures occurred throughout much of the state. High pressure over the western Atlantic generated an unusually warm westerly wind flow. A new record high temperature for the month of December of 76 degrees was established for Hartford at Bradley International Airport in Windsor Locks. The previous record was 74 degrees set on December 29, 1984. The maximum temperature of 76 degrees also shattered the previous record high for December 7, which was 62 degrees set in 1953. Incidentally, this came a few days after the record high for December 4 was tied. That record was 71 degrees which was originally set in 1982.

**CTZ002** Hartford

29	2200EST	0	0	Heavy Snow
30	0300EST			

A low pressure system passing southeast of Cape Cod brought some isolated snowfall amounts totaling around 6 inches to the highest elevations of northern Hartford County. One report of 6.2 inches was received from North Granby.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## CONNECTICUT, Northwest

**CTZ001**

**Litchfield**

**02 1500EST**  
**07 2000EST**

**0 0**

**Record Warmth**

The beginning of December was a period of record warmth across Litchfield County. An area of strong high pressure off the Mid-Atlantic coast produced a persistent south to southwesterly flow. From December 2 through 7, temperatures averaged 15 to 20 degrees above normal with daily high temperatures from the mid 50s to around 70 each day.

## CONNECTICUT, Southern

NONE REPORTED.

## DELAWARE

**DEZ001>004**

**New Castle - Kent - Inland Sussex - Delaware Beaches**

**01 0000EST**  
**07 1800EST**

**0 0 0 0**

**Unseasonably Warm**

A very strong and persistent ridge of high pressure at all levels of the atmosphere remained anchored across the western Atlantic Ocean and the Middle and South Atlantic States from November 28th through December 7th. The result was 10 consecutive days of record breaking, unseasonably warm weather across the state of Delaware. Many locations set new all-time monthly record high temperatures for December. The warmest days were December 4th, 6th and 7th. The highest temperatures included 75 degrees in Georgetown and at the New Castle County Airport. Other nearby highest temperatures included 78 degrees in Ocean City, MD and 77 degrees in Salisbury, MD. The daily high temperature record was tied (68 degrees) at the New Castle County Airport on the 3rd. New daily record high temperatures were set at the airport on the 4th (75 degrees) and 7th (72 degrees). The high temperature of 75 degrees on the 4th set a new all-time record for the month of December. The previous record was 74 degrees on December 29, 1984. In a paradoxical scene for early December, people were buying Christmas trees with shorts on. A cold front moved through the region late in the day on the 7th and dropped temperatures closer to normal levels.

**DEZ001>004**

**New Castle - Kent - Inland Sussex - Delaware Beaches**

**14 0900EST**  
**31 2359EST**

**0 0 0**

**Drought**

The run of unseasonably dry weather that began in July started to take its toll on water supplies throughout the Middle Atlantic States. As December continued to be unseasonably dry, even drier than the previous months in the headwater region, reservoir levels continued to fall. On December 14th, the Delaware River Basin Commission declared a drought warning for the 7.3 million people within its 13,539 square mile basin in Pennsylvania, New Jersey and Delaware. The Commission asked people to voluntarily cut back water usage by 15 percent. The Commission also cut back by 15 percent the amount of water New York City and New Jersey could remove from the upstream reservoirs and the river itself. On December 23rd, the Delaware River Basin Commission declared Stage Two of its drought warning. Water diversions by New York City and New Jersey were cut back an additional 15 percent in an effort to stretch existing supplies.

The drought's effects were not limited to the main stem of the Delaware River. The city of Newark could not use the White Clay Creek as its water source since August 6th. The streamflow since that day has been below fourteen million gallons per day. Stream levels along the Red Clay Creek and the Nanticoke River had fallen to a 54-year-low for the time of the year on December 11th. The flow along the Brandywine Creek and Saint Jones River were also near record low levels. Groundwater levels were below normal. As dry as July through November were, December was even drier in the northern part of the state. On a county weighted average, monthly precipitation was 94 percent of normal in Sussex County, but only 34 percent of normal in New Castle County. The precipitation total of 1.02 inches at the New Castle County Airport was the 5th driest December of this century.

**DEZ001>004**

**New Castle - Kent - Inland Sussex - Delaware Beaches**

**22 0700EST**  
**1900EST**

**0 0**

**0 Wind**

The large sea level pressure difference between a deepening low pressure system over the Canadian Maritimes and a large high pressure system over Kansas and Missouri produced peak wind gusts of around 40 mph in Delaware during the day on the 22nd. The highest recorded wind gust was 47 mph at the New Castle County Airport.

**DEZ001**

**New Castle**

**23 1600EST**  
**24 0500EST**

**0 0**

**0 Snow**

**DEZ002-004**

**Kent - Delaware Beaches**

**23 1600EST**  
**24 0800EST**

**0 0**

**0 Wintry Mix**

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## DELAWARE

### DEZ003

#### Inland Sussex

**23 1600EST 0 0 0 Winter Storm**  
**24 1200EST**

A series of weak low pressure systems moving northeast along a slow moving cold front over the western Atlantic Ocean brought the Delmarva Peninsula its first wintry precipitation of the season. Precipitation started as snow around 5 p.m. EST on the 23rd in Kent and New Castle Counties and as sleet in Sussex County. The precipitation changed over to sleet and freezing rain across the central part of the state during the evening of the 23rd and then to mainly freezing rain across Sussex County. The heaviest precipitation occurred before midnight. Light snow lingered through the early morning of the 24th in New Castle County. A mixture of freezing drizzle and sleet fell through the morning of the 24th in central and southern Delaware before the latest low pressure system pulled far enough offshore to end the precipitation. The heaviest snowfall accumulations occurred in New Castle County where precipitation fell mainly as snow and averaged between 2 and 4 inches. Farther south accumulations were 1.0 inch or less. The greatest accretion of ice (between 1/4 and 1/3 of an inch) was in the northern half of Sussex County.

This first wintry precipitation of the season caused many accidents, mainly fender benders during the evening of the 23rd. In New Castle County, there were 65 reported crashes between 4 p.m. EST and midnight EST on the 23rd. Most occurred between Smyrna and Odessa. The trip from Wilmington to Dover that normally takes one hour, took four hours. United States Route 13 was closed as vehicles were cleared from the road. Fourth Street in Wilmington was also closed. Minor accidents also occurred throughout Kent and Sussex County with the greatest concentration around the Georgetown area.

### DEZ001>004

#### New Castle - Kent - Inland Sussex - Delaware Beaches

**30 0700EST 0 0 0 Wind**  
**1800EST**

For the second time in about a week, strong winds buffeted the Delmarva Peninsula. The difference in surface pressure between a deepening low pressure system over the Canadian Maritimes and a high pressure system over Illinois and Missouri produced peak wind gusts during the daylight hours of around 40 mph in most areas. The highest wind gust at the Baltimore-Washington International Airport was 46 mph and at the New Castle County Airport was 41 mph.

### DEZ001>004

#### New Castle - Kent - Inland Sussex - Delaware Beaches

**31 2359EST 0 0 0 Unseasonably Warm And Dry**  
December continued the trend of drier than normal weather, especially in the northern part of the state. On a county weighted average, monthly precipitation was 94 percent of normal in Sussex County, but only 34 percent of normal in New Castle County. The precipitation total of 1.02 inches at the New Castle County Airport was the 5th driest December of this century. December was also another warm month and averaged around 5 degrees above normal. The mean temperature of 41.0 degrees at the New Castle County Airport was 5.2 degrees above normal and was tied for the 7th warmest December of this century.

## DISTRICT OF COLUMBIA

### DCZ001

#### District Of Columbia

**01 0000EST 0 0 Drought**  
**31 2359EST**

This was the sixth month in a row that drought conditions were seen across the Washington D.C. area. Persistent high pressure over the Southeast U.S. forced most precipitation producing low pressure systems to steer north of the region. In addition, record high temperatures baked the region during the first week of the month. Only 1.74 inches of precipitation fell at Washington Reagan National Airport in December, 1.38 inches below normal. In the past 127 years, only one other July through December on record (1930) received less precipitation than the last half of 1998. The 6 month total at the airport was only 7.45 inches, 12.82 inches below normal.

### DCZ001

#### District Of Columbia

**23 1400EST 0 0 Winter Weather**  
**24 0400EST**

A cold front swept across the Washington D.C. area on the 22nd of December, ushering in sub-freezing air that set the stage for a mixed bag of precipitation the following day. On the 23rd, a weak upper level disturbance from the Gulf States moved quickly across the Mid Atlantic region, dropping 0.4 inches of snow and a thin layer of ice and sleet at Washington Reagan National Airport. The combination of mixed precipitation, holiday travellers, and the first snowstorm of the season for drivers led to many traffic accidents. Law enforcement officials reported 70 collisions across the metropolitan area during the evening rush hour on the 23rd, and icy conditions on many bridges and roads. The 14th Street bridge across the Potomac River had to be temporarily shut down during the storm to be de-iced, causing a significant traffic delay.

### DCZ001

#### District Of Columbia

**30 1015EST 0 0 Strong Wind**

A vigorous area of low pressure moved over Pennsylvania on the 30th, creating windy conditions across the Washington D.C. area during the morning. At 10:15 AM, a wind gust of 44 MPH was recorded at Washington Reagan National Airport. The gusty winds knocked a large limb down onto Connecticut Avenue, one of the busiest thoroughfares in the city. The limb blocked traffic

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	December 1998
					Killed	Injured	Property	Crops
								Character of Storm

## DISTRICT OF COLUMBIA

in both directions between Bradley Boulevard and East West Highway for over 30 minutes until road crews could remove it.

## FLORIDA, East Central

NONE REPORTED.

## FLORIDA, Northeastern

NONE REPORTED.

## FLORIDA, Northwest

NONE REPORTED.

## FLORIDA, Southern

### **Broward County**

#### **Pompano Beach**

**20 1415EST 1 2 Rip Currents**

A Pompano Beach resident drowned in a rip current in the Atlantic off Pompano Beach while rescuing two women tourists. The tourists, who were standing on a sand bar at an unguarded beach, were treated by paramedics and released. M34IW

### **Collier County**

#### **25 W Marco**

**26 1330EST 0 0 50K Tstm Wind/Hail**

Large waves generated by a line of thunderstorms in the Gulf of Mexico swamped two boats, one 25 miles west of Marco Island and the other 200 yards offshore Vanderbilt Beach. A total of 22 persons were rescued from these vessels. A sailboat was smashed against the rocks near Gordon Pass.

### **FLZ063**

#### **Glades**

**26 1430EST 2 0 15K High Wind**

A wind shift line that had been generated by thunderstorms in the eastern Gulf of Mexico propagated east across Lake Okeechobee with wind gusts near 40 knots. A bass fishing boat in 16 feet of water just east of Lake Port capsized and two persons drowned. M45IW, M67IW

## FLORIDA, West Central

### **FLZ039-042>043-049>052**

#### **Levy - Citrus - Sumter - Pasco - Pinellas - Hillsborough - Polk**

**01 0400EST 0 0 0 0 Fog**  
**1000EST**

Patchy dense fog reduced visibility to less than one quarter mile along the Interstate 75 and U.S. Highway 19/41 corridors from Levy to Hillsborough Counties in West Central Florida.

### **FLZ039-042>043-048>052-055>057-060>062-065**

#### **Levy - Citrus - Sumter - Hernando - Pasco - Pinellas - Hillsborough - Polk - Manatee - Hardee - Highlands - Sarasota - De Soto - Charlotte - Lee**

**04 0400EST 0 0 0 0 Fog**  
**0900EST**

Areas of dense fog reduced visibility to less than one quarter mile along the Interstate 75 and U.S. Highway 19/41 corridors from Levy County south to Lee County over West Central and Southwest Florida.

### **FLZ039-042>043-048>052-055>057-060>062-065**

#### **Levy - Citrus - Sumter - Hernando - Pasco - Pinellas - Hillsborough - Polk - Manatee - Hardee - Highlands - Sarasota - De Soto - Charlotte - Lee**

**05 0500EST 0 0 0 0 Fog**  
**0900EST**

Dense fog reduced visibility to less than one quarter mile along the Interstate 75 and U.S. Highway 19/41 corridor from Levy County to Lee County in West Central and Southwest Florida.

### **FLZ039-042-048**

#### **Levy - Citrus - Hernando**

**18 0500EST 0 0 0 0 Freeze**  
**0800EST**

Freezing temperatures, between 30 and 32 degrees, with average duration of around one hour and possibly up to three hours at isolated locations, occurred in Levy, Citrus and Hernando Counties.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## FLORIDA, West Central

**FLZ039-042>043-048>052-055>057-060>062-065**      **Levy - Citrus - Sumter - Hernando - Pasco - Pinellas - Hillsborough - Polk - Manatee - Hardee - Highlands - Sarasota - De Soto - Charlotte - Lee**

**21      0300EST  
1200EST**      **0      0      0      0      Fog**

Widespread dense fog reduced visibility to less than one quarter mile over most counties of West Central and Southwest Florida. The dense fog lingered along portions of Florida's west coast, mainly west of the U.S. 41 Highway corridor, through noon.

**FLZ039-042>043-048>052-055>057-060>062-065**      **Levy - Citrus - Sumter - Hernando - Pasco - Pinellas - Hillsborough - Polk - Manatee - Hardee - Highlands - Sarasota - De Soto - Charlotte - Lee**

**22      0300EST  
1100EST**      **0      0      0      0      Fog**

Areas of dense fog reduced visibility to less than one quarter mile across most of West Central and Southwest Florida and lingered along coastal areas through late morning.

**FLZ039-042-048>051-055-060-062**      **Levy - Citrus - Hernando - Pasco - Pinellas - Hillsborough - Manatee - Sarasota - Charlotte**

**23      0500EST  
0800EST**      **0      0      0      0      Fog**

Patchy dense fog reduced visibility to a quarter mile or less over parts of West Central and Southwest Florida through sunrise.

## **Sarasota County**

**10 SW Venice**      **26      1105EST**      **1      0      30K      0      Tstm Wind (G35)**

A 77 year-old male died from the combined effects of a heart attack and hypothermia when his 21 foot fishing boat was overturned by two estimated 18-20 foot waves, approximately 10 miles southwest of Venice, Florida. The sudden and large waves were generated by estimated winds of 25 to 40 mph from a fast-moving cold front that extended from the Eastern Gulf of Mexico northeast across West Central Florida.

M77IW

**FLZ039-042>043-048>052-055>057-060>062-065**      **Levy - Citrus - Sumter - Hernando - Pasco - Pinellas - Hillsborough - Polk - Manatee - Hardee - Highlands - Sarasota - De Soto - Charlotte - Lee**

**28      0100EST  
0900EST**      **0      0      0      0      Fog**

Widespread dense fog reduced visibility to one quarter mile or less across most locations of West Central and Southwest Florida.

**FLZ039-042>043-048>052-055>057-060>062-065**      **Levy - Citrus - Sumter - Hernando - Pasco - Pinellas - Hillsborough - Polk - Manatee - Hardee - Highlands - Sarasota - De Soto - Charlotte - Lee**

**29      0030EST  
1030EST**      **0      0      0      0      Fog**

Widespread dense fog reduced visibility less than a quarter mile over most locations across West Central and Southwest Florida and lingered over interior sections through mid-morning.

## FLORIDA, West Panhandle

### **Okaloosa County**

**Mary Esther to  
Ft Walton Beach**      **22      0845CST  
0905CST**      **0      0      Waterspout**

A waterspout was sighted just over the Intracoastal Waterway south of Mary Esther. The waterspout went back up into the cloud and again reappeared over the Gulf just south of Fort Walton Beach. The waterspout moved east along the coast then went back up into the cloud. No damage was reported.

## GEORGIA, East Central

NONE REPORTED.

## GEORGIA, Lower

NONE REPORTED.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	December 1998	Character of Storm
					Killed	Injured	Property	Crops	

## GEORGIA, North and Central

**GAZ001>007-011>014-014-019>025-027** **Dade - Walker - Catoosa - Whitfield - Murray - Fannin - Gilmer - Chattooga - Gordon - Pickens - Dawson - Floyd - Bartow - Cherokee - Forsyth - Hall - Banks - Jackson - Madison**

**23 0500EST 0 0 Ice Storm**  
**1600EST**

Freezing rain deposited around a quarter inch of ice across northwest Georgia. By afternoon, falling temperatures in northeast Georgia caused the precipitation to begin freezing in counties in that part of the state also. Ice was frozen on bridges, overpasses, roadways, trees, and signs. Minor travel problems were encountered. There were a number of fender-bender automobile accidents.

**GAZ001>003**

**Dade - Walker - Catoosa**

**23 2000EST 0 0 10K Ice Storm**  
**24 0700EST**

Another area of freezing rain moved across the extreme northwest Georgia counties later in the night. Ice was heavy enough to knock down some trees and power lines. The Park Ranger at Cloudland Canyon in Dade county reported power outages at the campground. Law enforcement officials and Ham Operators in Walker and Catoosa counties reported trees and a few power lines down, as well as roads iced over.

**GAZ008>009-015>016**

**Union - Towns - Lumpkin - White**

**24 1900EST 0 0 Ice Storm**  
**25 0500EST**

Emergency dispatchers and the Greenville WSO reported bridges, overpasses, and trees coated with a glaze of ice around a quarter of an inch thick.

## GEORGIA, Northeast

**GAZ010-017>018**

**Rabun - Habersham - Stephens**

**23 0900EST 0 0 Freezing Rain/Sleet**  
**24 0500EST**

Freezing rain and some sleet developed early Wednesday morning and continued into the early morning of Christmas Eve. Ice accumulations were light and limited to trees and power lines. No problems developed as a result of the freezing precipitation.

## GEORGIA, Southeast

NONE REPORTED.

## GEORGIA, Southwest

NONE REPORTED.

## GEORGIA, West Central

**GAZ089**

**Muscogee**

**01 0000EST 0 0 0 0 Excessive Heat**  
**31 2359EST**

The average monthly temperature was 57.8 degrees and that tied the warmest ever temperature for December.

**GAZ089**

**Muscogee**

**01 0000EST 0 0 0 0 Drought**  
**31 2359EST**

The monthly rainfall was 1.49 inches and that was the second lowest rainfall total ever recorded for December.

**GAZ089**

**Muscogee**

**04 1500EST 0 0 0 0 Excessive Heat**  
**31 2359EST**

A new record high temperature of 79 degrees was set for this date.

**GAZ089**

**Muscogee**

**21 1500EST 0 0 0 0 Excessive Heat**  
**31 2359EST**

The record high temperature of 75 degrees was tied for this date.

## HAWAII

**HIZ002>005**

**Oahu - Maui - Island Of Hawaii - Molokai**

**01 0000HST 0 0 Drought**  
**31 2359HST**

The period from 1 to 13 December 1998 was marked by very strong trade winds that brought frequent but short-lived showers to windward sections of the island chain. The showers also arrived within the remnants of old shear lines that were embedded within

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## HAWAII

the trade flow. An abrupt change in the weather pattern occurred on 15 December with the passage of the first cold front of the 1998-99 cool season. This front was the first of three to push across the island chain during the month. The other two passed by on 28 December and 30-31 December. All three fronts brought showers to the islands but did not cause significant rain-related problems.

The late start to the 1998-99 cool season rains, combined with the lack of rain caused by the El Nino episode during the first half of 1998, resulted in most locales across the state having below average annual precipitation totals.

Below are rainfall statistics for selected locations from around the state. The first column is the rainfall for the month of December. The second has the 30-year average for each location, while the third column is the percent of average rainfall for the month of December.

	December 98	Avg.	% Avg.
Oahu			
Honolulu	1.15	3.8	30
Manoa Arbor.	11.62	14.3	81
Hawaii Kai	1.76	4.1	43
Ahuimanu	7.02	10.9	64
Waianae	0.58	3.3	18
Waialua	4.08	5.0	82
Maui			
Kahului	1.16	3.2	36
Hana	2.05	6.1	34
Kihei	1.82	2.4	76
Lahainaluna	1.57	3.4	46
Wailuku	4.34	4.3	101
Island of Hawaii			
Hilo	9.89	12.0	82
Pahala	0.74	5.4	14
Honaunau (Capt. Cook)	1.27	3.1	41
Kamuela (Upper)	2.91	6.0	49
Kamuela	1.03	7.3	14
Laupahoehoe	9.78	14.8	66
Molokai			
Kaunakakai	1.25	3.0	42

**HIZ003**

### **Maui**

**01 0000HST 0800HST 0 0 High Wind (G52)**

West to northwest winds of 50 to 60 mph affected the summit area of Haleakala.

**HIZ001>006**

### **Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**03 0900HST 05 1800HST 0 0 High Wind (G60)**

A strong high pressure area was centered north of Hawaii and was responsible for a tight pressure gradient across the island chain. This caused the very strong east to east/northeast trade winds that pummeled the state. The highest wind gust during the 3-5 Dec period was 69 mph, or 60 kt, at Kawaihae on the Island of Hawaii.

The high wind event caused sporadic power outages on all the islands, with power lines and poles being felled by strong gusts. Also, trees and branches landed on power lines and across roadways, creating temporary problems around the state. On Oahu, a two-car accident was caused by a tree falling across Pali Highway in the early morning hours of 4 Dec. In Maui, a downed power line triggered a fire that burned about five acres of brush at the former Olowalu landfill.

Some roofs on Oahu were torn off structures, including a refuse station in Kalihi and homes in Nanakuli, Manoa Valley, Kaimuki, and Waialae Nui ridge.

**HIZ001>006**

### **Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**04 1000HST 07 1500HST 0 0 High Surf**

Strong high north of the state produced large westward-moving swells that generated surf of 6 to 12 feet on east shores of all the islands. The high surf forced Big Island officials to close three beaches near Hilo on 4 Dec.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## HAWAII

**HIZ001>006**

**Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**09 1200HST 0 0 High Surf**  
**12 0600HST**

Intense storm low far northwest of Hawaii produced surf of 10 to 20 feet on west and north shores of all the islands.

**HIZ001>006**

**Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**13 0500HST 0 0 High Surf**  
**14 0200HST**

Storm low northwest of the state generated surf of 6 to 10 feet on west and north shores of all the isles.

**HIZ001>006**

**Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**15 0100HST 0 0 High Surf**  
**17 0100HST**

Storm low northwest of Hawaii caused surf of 8 to 12 feet on the north shores of all the islands. Three beachgoers on Oahu caught in the high surf were rescued by lifeguards on 16 Dec. There were no reported injuries.

## **Honolulu County**

**35 SE Honolulu**

**17 1000HST 0 0 Waterspout**  
**1015HST**

Pilot reported seeing two or three waterspouts southeast of Oahu.

**HIZ001>006**

**Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**18 0500HST 0 0 High Surf**  
**19 1600HST**

Strong low far northwest of the state produced surf of 8 to 15 feet on the west and north shores of all the isles.

**HIZ001>006**

**Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**22 1200HST 0 3 High Surf**  
**2030HST**

Low far off in the northwest Pacific caused surf of 6 to 10 feet on the north shores of all the islands. Three professional surfers were injured, with one almost drowning, as high surf affected conditions at the Banzai Pipeline on Oahu's North Shore.

**HIZ001>006**

**Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**27 1400HST 0 1 High Surf**  
**30 2000HST**

Intense storm low near the dateline generated surf of 6 to 10 feet on west shores and 15 to 20 feet on north shores of all the islands. One surfer was hurt and two tourists rescued by lifeguards as surf began to rise from near-flat conditions to heights up to six feet on both the west and north shores of Oahu on 27 Dec.

## **Kauai County**

**1 NW Kauai**

**28 0930HST 0 0 Waterspout**  
**0945HST**

Observers from shore spotted two waterspouts just northwest of Makaha Point.

## **Maui County**

**Lahaina to  
Lanai City**

**31 0400HST 0 0 Urban/Sml Stream Fld**  
**0700HST**

Heavy showers caused water damage to homes in Lahaina, a power outage in Kaanapali, and treacherous driving conditions on flooded roadways. On Lanai, saturated ground released boulders onto nearby streets.

**HIZ001>006**

**Kauai - Oahu - Maui - Island Of Hawaii - Molokai - Lanai**

**31 1200HST 0 0 High Surf**  
**2359HST**

Powerful storm low northwest of Hawaii produced surf of 8 to 12 feet on the north shores of all the islands.

## IDAHO, Extreme Southeast

NONE REPORTED.

## IDAHO, North

**IDZ005>006-009**

**Northern Clearwater Mountains - Southern Clearwater Mountains - Western Lemhi County**

**02 0445MST 0 0 Heavy Snow**  
**03 0400MST**

Cool Creek (6300 feet) 21 inches of snow

Elk Butte (5400 feet) 18 inches of snow

Shangshai (4600 feet) 8 inches of snow

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## IDAHO, North

Hemlock Butte (5810 feet) 12 inches of snow  
Lolo Pass (6120 feet) 9 inches of snow  
Twin Lakes (6400 feet) 10 inches of snow

### **IDZ007**

#### **Orofino / Grangeville Region**

**02 2300PST** 0 0 **High Wind (G61)**  
**03 0400PST**

Weather spotter reported estimated wind gusts up to 70 mph at Kooskia. Shingles on roof were torn off.

### **IDZ009>010**

#### **Western Lemhi County - Eastern Lemhi County**

**03 2220MST** 0 0 **Heavy Snow**  
**04 1010MST**

Leadore 8 inches of snow  
Meadow Lake (9000 feet) 15 inches of snow  
South of Salmon 8 inches of snow

### **IDZ005>006**

#### **Northern Clearwater Mountains - Southern Clearwater Mountains**

**24 0300MST** 0 0 **Heavy Snow**  
**1500MST**

10 N Orofino 19 inches of snow  
10 E Orofino 12 inches of snow  
1 S Elk River 8 inches of snow  
Fenn 9 inches of snow  
Red River hot Springs 5 inches  
Hemlock Butte 13 inches of snow

### **IDZ005>006-009>010**

#### **Northern Clearwater Mountains - Southern Clearwater Mountains - Western Lemhi County - Eastern Lemhi County**

**25 0425MST** 0 0 **Heavy Snow**  
**26 0412MST**

Cool Creek (6779 feet) 7 inches of snow  
Elk Butte (5420 feet) 17 inches of snow  
Moose Creek (6201 feet) 4 inches of snow

### **IDZ006-009>010**

#### **Southern Clearwater Mountains - Western Lemhi County - Eastern Lemhi County**

**27 1515MST** 0 0 **Heavy Snow**  
**28 1600MST**

Gibbonsville (4480 feet) Gibbonsville 7 inches of snow  
Hemlock Butte (5810 feet) 29 inches of snow  
Shanghai Summit (4600 feet) 10 inches of snow  
Powell (3530 feet) 10 inches of snow  
Elk Butte (5420 feet) 17 inches of snow  
Headquarters (3165 feet) 6 inches of snow

## IDAHO, Northwest

### **IDZ001-004**

#### **Northern Panhandle - Central Panhandle Mountains**

**01 0700PST** 0 0 0 0 **Winter Storm**  
**02 0900PST**

In addition to 4 - 8" of snow, winds of 50-60 mph were reported at the mountain passes.

### **IDZ001>004**

#### **Northern Panhandle - Coeur D'Alene Area - Idaho Palouse - Central Panhandle Mountains**

**02 0900PST** 0 0 0 0 **Heavy Snow**  
**28 0900PST**

Several reports of 8-18" of snow in a 12 hour period were received each day from Sandpoint to Lookout Pass, Coeur d'Alene area, Moscow to Potlatch and near Kellogg.

### **IDZ001**

#### **Northern Panhandle**

**22 0100PST** 0 0 0 0 **Extreme Cold**  
**1000PST**

Temperatures of -20 and -28 F were reported at the Lookout Pass and near Sandpoint.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage Property	Crops	Character of Storm
Killed	Injured								

## IDAHO, Northwest

### Latah County

Moscow	27	0300PST			0	0	5K	0	Flood
	29	0800PST							

Minor flooding of small streams and creeks occurred due to snow melt and 2 - 4" of rain during this period.

### IDZ003

#### Idaho Palouse

	25	1800PST			0	0	140K		High Wind
		2300PST							

Strong winds accompanied by a winter storm caused damage to a school roof, a shed and several house roofs near Worley and Plummer in Benewah County.

## IDAHO, Southeast

### IDZ019-032

#### Upper Snake Highlands - Lost River / Pahsimeroi

	03	0900MST			0	0			Heavy Snow
	05	2100MST							

A winter storm brought heavy snow to the mountains along the Idaho/Montana border. The Upper Snake Highlands reported 8 to 12 inches of snow. Accumulation of 7 inches were reported in Ashton and St Anthony, and 5 inches in Rexburg. In the area from Idaho Falls north to the Upper Snake Highlands, numerous vehicle minor accidents and slide offs were reported despite snow amounts below advisory levels. The Lost River Valley in Custer county reported 6 inches of snow.

### IDZ019

#### Upper Snake Highlands

	25	1600MST			0	0			Heavy Snow
	26	1000MST							

Heavy snow fell in the mountains near the Idaho /Montana border. Snow accumulation of 6 to 12 inches was reported.

### IDZ019-023-031

#### Upper Snake Highlands - Caribou Highlands - Big And Little Wood River Region

	27	1800MST			0	0			Heavy Snow
	28	1000MST							

A winter storm brought heavy snow to the mountains of Eastern Idaho. Generally accumulation of 6 inches was reported at many locations, from Soda Springs to Island Park. However, Galena Lodge near Sun Valley reported 2 feet of new snow.

## IDAHO, Southwest

### IDZ011-013-029

#### West Central Mountains - Boise Mountains - Owyhee Mountains

	02	1000MST			0	0			Heavy Snow
		1800MST							

A moist pacific storm brought local heavy snow to south western Idaho's mountains. In the West Central Mountains McCall received 6 inches of snow while several high elevation remote stations in the West Central Mountains and Boise Mountains probably received over a foot of snow. In the Owyhee Mountains 7 inches of snow fell just across the Idaho border near Jordan Valley, Oregon.

### IDZ011>015

#### West Central Mountains - Lower Treasure Valley - Boise Mountains - Upper Treasure Valley - Southwest Highlands

	24	1500MST			0	0			Heavy Snow
	25	1800MST							

Starting on Christmas Eve and lasting through much of Christmas Day a strong pacific storm dumped heavy snow over much of south western Idaho. In the Treasure Valley Boise received 6 inches of snow, the Caldwell area received 6 to 7 inches with as much as 10 inches falling near Weiser. Traffic was severely disrupted in the Boise area on Christmas eve with over 30 accidents reported in a 90 minute period. The central mountains received the heaviest snow fall with 10 inches reported at Smith's Ferry, Deadwood and Idaho City. In the Boise Mountains Placerville received 17 inches. In the Southwest Highlands of Idaho, Murphy received 6 inches of new snow from this storm.

### IDZ011-013-028

#### West Central Mountains - Boise Mountains - Camas Prairie

	27	1600MST			0	0			Heavy Snow
	28	1800MST							

A winter storm dropped heavy snow throughout the western central mountains of Idaho. In the West Central Mountains 15 inches fell at Deadwood Reservoir while Council received 12 inches. Six to 10 inches fell in the Cascade area. In the Boise Mountains Placerville received 12 inches. On the Camas Prairie the town of Fairfield picked up 12 inches from this storm.

## ILLINOIS, Central

### Vermilion County

Collison to 1.8 E Collison	06	1855CST	2	200	0	0	300K	0	Tornado (F0)
		1900CST							

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ILLINOIS, Central

A tornado touched down on the west side of Collison. It caused moderate to major damage to a dozen homes and destroyed a post office and two mobile homes. Dozens of trees were blown over and numerous projectiles...ranging from small tree branches to 2 inch by 8 inch boards...were either driven into the ground or into structures. No injuries or deaths were reported. Damage was estimated around \$300,000.

### **Edgar County**

**Paris to** **06 1900CST** **0 0 25K 0 Thunderstorm Wind**  
**1 E Paris 1910CST**

Thunderstorm winds blew down a large sign and several power poles in Paris. Just east of Paris a pole barn was destroyed. No injuries were reported and damage to the pole barn was estimated around \$25,000.

### **Vermilion County**

**1 W Hoopeston 06 1910CST 0 0 0 Thunderstorm Wind**

Thunderstorm winds destroyed a shed and blew down several trees and power lines one mile west of Hoopeston.

### **ILZ036-041>042**

#### **Fulton - Mason - Logan**

**30 1430CST 0 0 Heavy Snow**  
**31 0230CST**

A quick moving storm system produced a narrow band (approximately 10 miles wide) of heavy snow over three counties in Central Illinois, mainly along a line from Marietta (Fulton County) to Mason City (Mason County) to Lincoln (Logan County). Six inches of snow fell in Marietta and 7.3 inches of snow was reported in Lincoln. No injuries or deaths were reported. The rest of Central Illinois reported 2 to 4 inches of snow with the storm system.

## ILLINOIS, Northeast

### **Kankakee County**

**5 N St Anne 06 1055CST 0 0 Hail (0.75)**

## ILLINOIS, Northwest

### **ILZ001>002-007**

#### **Jo Daviess - Stephenson - Carroll**

**06 1500CST 0 0 Winter Storm**  
**2100CST**

Rain developed throughout Eastern Iowa and Northwest Illinois ahead of an arctic cold front which swept across the region. By late afternoon the rain began to change to snow as colder air overspread the area. The snow mixed with sleet and freezing rain at times, mainly along and south of I-80. Roads became slick and snowpacked north of I-80 resulting in treacherous driving conditions and numerous accidents. Most of the snow fell in a swath from Iowa City to Dubuque and Freeport where accumulations ranged from 1 to 3 inches.

### **ILZ001>002-007-009-015>018-024>026-034>035**

#### **Jo Daviess - Stephenson - Carroll - Whiteside - Rock Island - Henry - Bureau - Putnam - Mercer - Henderson - Warren - Hancock - McDonough**

**30 1700CST 0 0 Winter Storm**  
**2300CST**

A clipper system dropped out of Canada across the upper Midwest and brought a round of snow to Eastern Iowa and Northwest Illinois. Accumulations generally ranged from 1 to 3 inches, however a swath of heavier snow fell over Southeast Iowa and West Central Illinois along and south of Highways 92 and 34 with amounts ranging from 4 to 6 inches. Numerous accidents were reported due to the snow.

## ILLINOIS, South

### **ILZ075>078-080>094**

#### **Jefferson - Wayne - Edwards - Wabash - Perry - Franklin - Hamilton - White - Jackson - Williamson - Saline - Gallatin - Union - Johnson - Pope - Hardin - Alexander - Pulaski - Massac**

**01 0001CST 0 0 Unusual Warmth**  
**08 0001CST**

Temperatures averaged 20 to 30 degrees above normal during the first week of the month. Highs were around 70 most of the week. The heating industry reported some loss of revenue as a result of the weather. A gas company reported the average customer's bill was down 27 percent from the same time last year. Other businesses, such as the outdoor construction industry, benefited from the extended period of warmer weather.

### **Jackson County**

**Carbondale 06 2045CST 0 0 5K Thunderstorm Wind (G52)**

Five to eight trees were down along Country Club Road.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated		December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	
									Character of Storm

## ILLINOIS, South

**ILZ075>078-080>094** Jefferson - Wayne - Edwards - Wabash - Perry - Franklin - Hamilton - White - Jackson - Williamson - Saline - Gallatin - Union - Johnson - Pope - Hardin - Alexander - Pulaski - Massac

21 1500CST 0 0 Freezing Rain  
2000CST

Rain changed to freezing rain and sleet late in the afternoon as a sharp cold front moved across the region. Temperatures plummeted from the upper 50s during the morning into the upper 20s by early nightfall. The wintry precipitation lasted for only a few hours, but was sufficient to cause numerous accidents. Most involved vehicles spinning out of control and sliding into ditches, but one accident was fatal. In Williamson County, a vehicle left the road and flipped over, killing the driver.

**ILZ084>085-088>094** Jackson - Williamson - Union - Johnson - Pope - Hardin - Alexander - Pulaski - Massac

23 1300CST 0 0 Snow  
2100CST

A light snowfall, the first of the season in some areas, provided a one-inch coating. Road surfaces became extremely slippery, and numerous accidents were reported. Two of the accidents left drivers with major injuries and traffic backups stretching several miles. A tractor-trailer rig northbound on Interstate 57 near Marion jackknifed and crossed the median into the southbound lanes. The driver of a car that was struck by the truck was seriously injured. Traffic on Interstate 57 was detoured onto side roads until the accident could be cleared. Another accident on U.S. 51 about 8 miles south of Carbondale closed that road for a while. Three vehicles were involved in that wreck, and one person was seriously injured. Numerous other accidents were reported across the region, mostly minor.

**ILZ075>078-082>083-086>087** Jefferson - Wayne - Edwards - Wabash - Hamilton - White - Saline - Gallatin

30 1600CST 0 0 Snow  
2100CST

A 1 to 3 inch snowfall occurred, resulting in snow-covered and hazardous roadways.

## ILLINOIS, Southwest

### Randolph County

Blair 06 1900CST 0 0 Thunderstorm Wind (G52)  
Thunderstorm wind gusts destroyed 2 machine sheds and damaged a grain bin and other outbuildings at a couple of farms near Blair. A couple of 2x4 boards from the destroyed machine sheds were driven through a nearby vacant house.

### Marion County

Salem 06 1920CST 0 0 Thunderstorm Wind (G61)  
Thunderstorm wind gusts reaching an estimated 70 mph caused scattered damage in Salem. Some trees and utility lines were downed and a few storage buildings damaged. Some of the downed trees and large tree limbs damaged some fences and a garage.

**ILZ058>060-064>065-069>070-074-079-095>102** Greene - Macoupin - Montgomery - Bond - Fayette - Clinton - Marion - Washington - Randolph - Adams - Brown - Pike - Calhoun - Jersey - Madison - St. Clair - Monroe

21 0000CST 0 0 Winter Storm  
22 1800CST

Winter came in with a vengeance, appropriately enough, on the 1st day of winter across west and southwest Illinois. A strong cold front brought the first blast of Arctic air to the state. This was quite a shock for many people as temperatures previously in the month had been quite mild, with highs ranging from the 50s to the 70s. Light freezing drizzle, sleet and snow came in with the cold front. Roads across much of the area became covered with a thin coating of ice by the morning rush hour on the 21st. Automobile accidents were numerous. Temperatures the night/morning of the 21st/22nd dropped into the single digits in most areas and only rose into the teens on the 22nd.

## INDIANA, Central

### Boone County

Whitestown 06 2025EST 0 0 Thunderstorm Wind (G50)  
2030EST

### Vermillion County

Dana 06 2055EST 0 0 Thunderstorm Wind (G50)

### Tippecanoe County

Countywide 06 2100EST 0 0 200K Thunderstorm Wind (G66)  
2130EST

# Storm Data and Unusual Weather Phenomena

									December 1998
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Crops	Character of Storm
INDIANA, Central									
Montgomery County									
Crawfordsville	06	2110EST 2112EST			0	0			Thunderstorm Wind (G50)
Parke County									
Countywide	06	2115EST 2130EST			0	0			Thunderstorm Wind (G50)
Carroll County									
Rockfield	06	2120EST 2122EST			0	0			Thunderstorm Wind (G65)
Clay County									
1 E Cardonia to Cardonia	06	2120EST 2122EST			0	0			Thunderstorm Wind (G50)
Clinton County									
Kirklin	06	2120EST 2122EST			0	0			Thunderstorm Wind (G50)
Putnam County									
Greencastle	06	2130EST			0	0	5K		Thunderstorm Wind (G50)
Boone County									
Zionsville	06	2145EST			0	0			Thunderstorm Wind (G56)
Howard County									
Countywide	06	2145EST 2215EST			0	0			Thunderstorm Wind (G50)
Knox County									
3 NE Vincennes	06	2155EST			0	0			Thunderstorm Wind (G50)
Tipton County									
Kempton	06	2155EST			0	0			Thunderstorm Wind (G50)
Hamilton County									
Sheridan to 5 E Noblesville	06	2159EST 2223EST			0	0			Thunderstorm Wind (G50)
Owen County									
Coal City	06	2215EST			0	0	10K		Thunderstorm Wind (G55)
Madison County									
Frankton	06	2241EST			0	0	10K		Thunderstorm Wind (G60)
Marion County									
Bridgeport	06	2245EST			0	0	10K		Thunderstorm Wind (G55)
Henry County									
2 S Mechanicsburg	06	2255EST			0	0	20K		Thunderstorm Wind (G65)
A fast moving squall-line marched through the state ahead of a strong cold front producing widespread thunderstorm wind damage. Some of the most notable damage occurred across Tippecanoe, Madison and Henry counties. Severe damage occurred in West Lafayette at Purdue University when University Hall received major roof damage totalling 100 thousand dollars. Wind gauges across the county reported from 72 to 77 mile an hour wind gusts as the line passed through. In Carroll county, a 35 car freight train derailed near Rockfield as the line gust front pushed through. Frankton saw roof damage as well as a barn demolished, while at Henry county just south of Mechanicsburg, a mobile home was thrown of its foundation. Several other counties saw roof damage as well as numerous trees and power lines down.									
Morgan County									
Martinsville	06	2230EST 2240EST			0	0	100K		Thunderstorm Wind (G60)
A roof was blown off a Super 8 Motel along State Road 37 on the south side of Martinsville. Also, a sign was blown off a pizza parlor damaging 30 autoimobiles at an auto dealership. Winds were estimated at 70 mph.									
INDIANA, Northeast									
Elkhart County									
Simonton Lake	06	1330EST			0	0	5K		Thunderstorm Wind

# Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	December 1998	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Persons Injured	Damage Property	Crops	Character of Storm
<b>INDIANA, Northeast</b>									
DOZENS OF TREES UPROOTED ACROSS NORTHERN OSOLO TOWNSHIP.									
<b>Elkhart County</b>									
Simonton Lake	06	2050EST 2105EST			0	0	10K		Thunderstorm Wind
TREES FELL ON ELECTRICAL LINES CAUSING POWER OUTAGES.									
<b>Cass County</b>									
Logansport	06	2130EST 2135EST			0	0	100K		Thunderstorm Wind
STRONG WINDS CAUSED PART OF THE THIRD STORY OF THE TOTAL DISCOUNT STORE IN LOGANSPORT TO COLLAPSE. THE SOUTHWEST CORNER OF THE BUILDING FELL ONTO HAP'S DOWNTOWNER, A RESTAURANT LOCATED NEXT DOOR. ELECTRICAL POWER POLES WERE BROKEN, CAUSING POWER OUTAGES. NUMEROUS TREE LIMBS WERE ALSO KNOCKED DOWN, RESULTING IN DAMAGE TO TWO AUTOMOBILES. TO THE SOUTHEAST OF LOGANSPORT, IN WALTON, A GRAIN BIN WAS APPARENTLY BLOWN OVER BY THE WIND.									
<b>Miami County</b>									
Peru	06	2145EST 2150EST			0	0	10K		Thunderstorm Wind
POWER OUTAGES CAUSED BY HIGH WINDS KNOCKING TREE BRANCHES ONTO WIRES.									
<b>Miami County</b>									
Peru	06	2145EST 2150EST			0	0	20K		Thunderstorm Wind
WIND DESTROYED ONE MOBILE HOME AND DAMAGED ANOTHER.									
<b>Miami County</b>									
(Gus)Grissom Afb Per to Chili	06	2150EST 2200EST			0	0	50K		Thunderstorm Wind (G71)
ROOF TORN OFF UAP/RICHTER WAREHOUSE. OTHER BUILDINGS IN PERU DAMAGED.									
<b>Whitley County</b>									
Coesse	06	2200EST			0	0	10K		Thunderstorm Wind (G57)
TOOL SHED ROOF TORN OFF									
<b>Grant County</b>									
Marion	06	2203EST			0	1	10K		Thunderstorm Wind
AUTOMOBILE SIGNIFICANTLY DAMAGED WHEN PART OF A TREE FELL ACROSS IT.									
<b>Adams County</b>									
Decatur	06	2235EST 2240EST			0	0	30K		Thunderstorm Wind
GARAGE DESTROYED. EIGHT AMERICAN ELECTRIC POWER POLES WERE KNOCKED DOWN.									
<b>Elkhart County</b>									
Elkhart	06	2100EST			0	0	0		Thunderstorm Wind
SEVERAL TREES BLOWN DOWN.									
<b>Miami County</b>									
Bunker Hill	06	2145EST			0	0	10K		Thunderstorm Wind
SEVERAL TREES BLOWN DOWN. ONE BARN LOST A THIRD OF ITS ROOF.									
<b>Whitley County</b>									
Columbia City	06	2211EST			0	0	50K		Thunderstorm Wind
NUMEROUS TREES BLOWN DOWN. ONE BARN COMPLETELY LOST ITS ROOF.									
<b>Wabash County</b>									
Wabash	06	2213EST			0	0	20K		Thunderstorm Wind
SEVERAL TREES...POWER POLES AND LINES WERE BLOWN DOWN IN TOWN.									
<b>Huntington County</b>									
Huntington	06	2215EST			0	0	10K		Thunderstorm Wind
SEVERAL TREES WERE UPROOTED OR SNAPPED IN TOWN.									
<b>De Kalb County</b>									
Auburn	06	2220EST			0	0	0		Thunderstorm Wind
LOTS OF TREE LIMBS WERE BLOWN DOWN.									

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
<b><u>INDIANA, Northeast</u></b>									
<b>Wells County</b>									
Bluffton	06	2225EST			0	0	10K		Thunderstorm Wind
MANY TREES AND POWER LINES WERE BLOWN DOWN.									
<b>Adams County</b>									
2 S Williams to Williams	06	2245EST			0	0	10K		Thunderstorm Wind
SEVERAL POWER POLES WERE SNAPPED.									
<b><u>INDIANA, Northwest</u></b>									
<b>Jasper County</b>									
Wheatfield	06	1230EST			0	0			Hail (0.75)
<b><u>INDIANA, South Central</u></b>									
NONE REPORTED.									
<b><u>INDIANA, Southeast</u></b>									
<b>Wayne County</b>									
Dalton	06	2325EST 2330EST			0	0	3K		Thunderstorm Wind (G50)
Trees knocked down.									
<b><u>INDIANA, Southwest</u></b>									
<b>INZ081&gt;082-085&gt;088 Gibson - Pike - Posey - Vanderburgh - Warrick - Spencer</b>									
01	0001CST				0	0			Unusual Warmth
08	0001CST								
Temperatures averaged some 20 to 30 degrees above normal during the first week of the month. Daytime highs were in the upper 60s and lower 70s most of the week. The warm weather resulted in less business for the heating industry. One gas company reported the average customer's bill was 27 percent lower than the same time last year. Other industries, such as outdoor construction, benefited from the good weather.									
<b>Gibson County</b>									
Countywide	21	1400CST 1600CST			0	0			Urban/Sml Stream Fld
<b>Posey County</b>									
Countywide	21	1400CST 1600CST			0	0			Urban/Sml Stream Fld
<b>Vanderburgh County</b>									
Countywide	21	1400CST 1600CST			0	0			Urban/Sml Stream Fld
<b>Warrick County</b>									
Countywide	21	1400CST 1600CST			0	0			Urban/Sml Stream Fld
Heavy rainfall between 1 and 2 inches fell within 12 hours on frozen ground. Pigeon Creek rose rapidly, and there was standing water on roadways. No reports of significant flooding were received.									
<b>INZ081&gt;082-085&gt;088 Gibson - Pike - Posey - Vanderburgh - Warrick - Spencer</b>									
21	1900CST 2300CST				0	0			Freezing Rain
Rain during the day changed to sleet and freezing rain during the evening as a sharp cold front passed through the region. The wintry precipitation lasted a few hours, long enough to ice up most roads and walkways. Temperatures plunged from the upper 50s in the morning to the upper 20s early at night. Numerous skidding accidents were reported.									
<b>INZ081&gt;082-085&gt;088 Gibson - Pike - Posey - Vanderburgh - Warrick - Spencer</b>									
23	1600CST 2100CST				0	0			Snow
A light snowfall coated the region with around an inch of the white stuff. Travel was impacted due to very cold road surfaces, which allowed the snow to readily stick to the roads. The wintry precipitation hit right near the evening commute time. A rash of accidents occurred, mostly minor.									

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## INDIANA, Southwest

**INZ081>082-085>088 Gibson - Pike - Posey - Vanderburgh - Warrick - Spencer**

**30 1800CST 2300CST 0 0 Snow**

A one to two inch snowfall resulted in snow-covered and slippery roads.

## IOWA, Central

**IAZ035>036- Webster - Hamilton - Boone - Story - Dallas - Polk**

**047>048-059>060**

**30 0900CST 1500CST 0 0 Heavy Snow**

Low pressure dropped into eastern Montana during the evening of the 29th, then slid southeast into eastern Kansas by the evening of the 30th. This low pressure was the first true Alberta Clipper system to affect Iowa with wintry weather. Very strong warm air advection took place over the top of the Arctic air that was in place over Iowa. Snow broke out to the northeast of the warm front poised to the southwest of the state. Snow fell quite heavily for a period of three to 5 hours in many areas. A small area of the snow band became convective with heavier snowfall over several counties of central Iowa. Six to seven inches of snow fell in a few hours time in a band extending from Fort Dodge to Des Moines. It was fortunate that winds were not very strong during this event. There were numerous reports of traffic accidents as this was the first real winter snow of the season for many areas of the state.

## IOWA, East Central and Southeast

**IAZ040>042- Buchanan - Delaware - Dubuque - Benton - Linn - Jones - Jackson - Iowa - Johnson - Cedar - Clinton**

**051>054-063>066**

**06 1500CST 2100CST 0 0 Winter Storm**

Rain developed throughout Eastern Iowa and Northwest Illinois ahead of an arctic cold front as it swept across the region. By late afternoon the rain began to change to snow as much colder air overspread the area. The snow mixed with sleet and freezing rain at times...mainly along and south of I-80. Roads became slick and snowpacked resulting in treacherous driving conditions and numerous accidents. Most of the snow fell in a swath from near Iowa City to near Dubuque where accumulations ranged from 2 to 4 inches. Amounts elsewhere were around an inch or less.

**IAZ040>042- Buchanan - Delaware - Dubuque - Benton - Linn - Jones - Jackson - Iowa - Johnson - Cedar - Clinton**

**051>054-063>066**

**06 1500CST 2100CST 0 0 Winter Storm**

Rain developed throughout Eastern Iowa and Northwest Illinois ahead of an arctic cold front which swept across the region. By late afternoon the rain began to change to snow as colder air overspread the area. The snow mixed with sleet and freezing rain at times, mainly along and south of I-80. Roads became slick and snowpacked north of I-80 resulting in treacherous driving conditions and numerous accidents. Most of the snow fell in a swath from Iowa City to Dubuque and Freeport where accumulations ranged from 1 to 3 inches.

**IAZ030-040>042- Clayton - Buchanan - Delaware - Dubuque - Benton - Linn - Jones - Jackson - Iowa - Johnson - Cedar - Clinton - Muscatine - Scott - Keokuk - Washington - Louisa - Jefferson - Henry - Des Moines - Van Buren - Lee**

**076>078-087>089-098>099**

**30 1600CST 2200CST 0 0 Winter Storm**

A clipper system dropped out of Canada across the upper midwest and brought a round of snow to Eastern Iowa and Northwest Illinois. Accumulations generally ranged from 1 to 3 inches, however a swath of heavier snow fell over Southeast Iowa and West Central Illinois along and south of Highways 92 and 34 with amounts ranging from 4 to 6 inches. Numerous accidents were reported due to the snow.

## IOWA, Northeast

NONE REPORTED.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Property	Crops	Character of Storm
Killed	Injured									

## IOWA, Northwest

NONE REPORTED.

## IOWA, Southwest

NONE REPORTED.

## KANSAS, East

**KSZ026-035>040-054>055-058**

**Jefferson - Dickinson - Geary - Morris - Wabaunsee - Shawnee - Douglas - Lyon - Osage - Coffey**

**20 0700CST 0 0 Ice Storm**  
**21 0300CST**

A wintry mix of light snow, freezing drizzle and some freezing rain spread over the listed counties from the morning of the 20th through the early morning of the 21st. Roads became slick and icy as a result and many accidents occurred. Four people were killed in accidents (mentioned below). One law enforcement officer described U.S. Highway 40 as a "skating rink". Very cold conditions accompanied the wintry mix of precipitation and wind chills in many areas were below zero. Several schools were closed the day after the storm.

**KSZ040-054>055**

**Douglas - Lyon - Osage**

**20 1400CST 4 0 Ice Storm**  
**21 1830CST**

Freezing drizzle and snow caused icy road conditions and resulted in 4 fatal accidents which killed 4 people. A two vehicle accident occurred on Highway 10 near Eudora. and killed a woman. A vehicle slid on Interstate 35 in Lyon county during the afternoon and crossed the median strip where it collided with a tractor trailer. The male driver of the vehicle was killed. Two single vehicle accidents occurred about ten minutes apart on Interstate 35 in Osage county. The vehicles slid on the icy roadway and overturned. One person was killed in each accident.  
F46VE, M23VE, M49VE, F20VE

## KANSAS, Extreme Southeast

**KSZ073-097-101**

**Bourbon - Crawford - Cherokee**

**20 0200CST 0 0 Winter Storm**  
**21 2100CST**

Periods of light rain, freezing rain, freezing drizzle, and light snow caused numerous traffic accidents in extreme southeast Kansas. There were no reports of any serious injuries. Precipitation amounts were light and no structural damage due to ice was reported.

## KANSAS, North Central

**KSZ005>007-017>019 Phillips - Smith - Jewell - Rooks - Osborne - Mitchell**

**20 0000CST 0 0 0 0 Extreme Cold**  
**23 1800CST**

After weeks of unseasonably warm weather across north-central Kansas, a strong arctic surge brought a quick end to the warmth. Temperatures steadily declined into the single digits by the evening of the 20th as arctic air sagged south across the area. Snowfall for the event was light and ranged from 1 to 2 inches. As the cold air deepened by the morning of the 22nd, temperatures fell well below zero. The coldest morning of the season so far was on the 23rd, when temperatures dropped as low as 10 below zero with clear skies. Wind chill readings ranged from 20 to 45 below zero. The cold surge gave way to warmer weather by Christmas Day.

## KANSAS, Northeast

**KSZ057-060**

**Miami - Linn**

**01 0000CST 0 0 Flood**  
**03 2359CST**

Minor flooding occurred along the Marais Des Cygnes River during the beginning of December.

Marais Des Cygnes River  
Osawatomie, KS

Flood Stage 28 ft  
Above Flood Stage 12/1 to 12/2  
Crest 28.3 ft on 12/1

La Cygnes, KS

Flood Stage 25 ft  
Above Flood Stage 12/2 to 12/3

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		

December 1998

## KANSAS, Northeast

<b>KSZ057-060</b>		Crest	25.25 ft on 12/3						
		<b>Miami - Linn</b>							
	<b>07</b>	<b>0000CST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
	<b>09</b>	<b>2359CST</b>							
	Minor flooding occurred again along the Marais Des Cygnes River from Dec 7-9.								
		Marais Des Cygnes River							
		Osawatomie, KS							
		Flood Stage	28 ft						
		Above Flood Stage	12/7 to 12/8						
		Crest	28.5 ft on 12/8						
		La Cygnes, KS							
		Flood Stage	25 ft						
		Above Flood Stage	12/8 to 12/9						
		Crest	25.8 ft on 12/9						

## KANSAS, Northwest

NONE REPORTED.

## KANSAS, Southeast

NONE REPORTED.

## KANSAS, Southwest

NONE REPORTED.

## KENTUCKY, Central

**KYZ048-055>056-065-067-070>077-081>082** **Jessamine - Boyle - Garrard - Taylor - Lincoln - Logan - Warren - Simpson - Allen - Barren - Monroe - Metcalfe - Adair - Cumberland - Clinton**

**23 0900EST 1500EST 0 0 Winter Storm**

Low pressure moving across the Tennessee Valley combined with cold air at the surface across southern Kentucky brought a mixture of freezing rain and sleet to much of southern and eastern Kentucky. Roads quickly became slick and hazardous during the morning and caused multiple automobile accidents across the area.

## KENTUCKY, Eastern

### **Pulaski County**

**Nancy 21 2325EST 0 0 5K 0 Thunderstorm Wind**  
Roof blown off home.

### **Laurel County**

**East Bernstadt 22 0000EST 0 0 5K 0 Thunderstorm Wind**  
Trailer was blown off its foundation.

### **Harlan County**

**Verda 22 0115EST 0 0 5K 0 Thunderstorm Wind**  
Numerous reports of trees and power lines downed throughout county. One tree fell onto a trailer at Brittians Creek.

**KYZ068>069-079>080-083>088-107-109>120** **Rockcastle - Jackson - Pulaski - Laurel - Wayne - McCreary - Whitley - Knox - Bell - Harlan - Johnson - Magoffin - Floyd - Lee - Breathitt - Knott - Owsley - Perry - Clay - Leslie - Letcher - Martin - Pike**

**23 1200EST 24 0300EST 0 0 0 0 Winter Storm**

A winter storm affected eastern Kentucky from late morning on December 23 into the early morning of December 24. Arctic air in place at the surface with warm air moving in aloft created a wintery mixture of freezing rain and sleet. The accumulating sleet and glaze was confined south of a line from Beattyville northeast to Inez.

# Storm Data and Unusual Weather Phenomena

December 1998

December 1998									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

## KENTUCKY, Eastern

Ice accumulations ranged from one quarter inch to around one inch in many locations especially in the Cumberland Valley and in the counties along the Virginia and West Virginia border. The mixture created numerous traffic accidents throughout eastern Kentucky.

## KENTUCKY, Northeast

### **KYZ101>103-105 Greenup - Carter - Boyd - Lawrence**

<b>06</b>	<b>1200EST</b>	<b>0</b>	<b>0</b>	<b>Record Warmth</b>
	<b>1800EST</b>			

Afternoon temperatures peaked in the mid 70s. For example, Ashland and Grayson had 76 degrees. It marked the peak and end of an unusual 2 week warm spell.

## KENTUCKY, Northern

NONE REPORTED.

## KENTUCKY, Southwest

### **KYZ001>022 Fulton - Hickman - Carlisle - Ballard - Mccracken - Graves - Livingston - Marshall - Calloway - Crittenden - Lyon - Trigg - Caldwell - Union - Webster - Hopkins - Christian - Henderson - Daviess - Mclean - Muhlenberg - Todd**

<b>01</b>	<b>0001CST</b>	<b>0</b>	<b>0</b>	<b>Unusual Warmth</b>
<b>07</b>	<b>0001CST</b>			

Temperatures averaged 20 to 30 degrees above normal during the first week of the month. Highs were in the lower 70s from the 4th to the 6th. Some industries struggled through what was traditionally their busiest time of year. Other businesses experienced unusual growth. One propane distributor estimated a 10 to 15 percent drop in sales over the same time last year. Even though the heating and plumbing businesses took a hit, the retail industry benefited from the good weather as more people ventured out. Outdoor construction projects proceeded later into the season than usual.

### **KYZ001>008-010>011-013>016-018>020 Fulton - Hickman - Carlisle - Ballard - Mccracken - Graves - Livingston - Marshall - Crittenden - Lyon - Caldwell - Union - Webster - Hopkins - Henderson - Daviess - Mclean**

<b>21</b>	<b>1800CST</b>	<b>0</b>	<b>0</b>	<b>Freezing Rain</b>
	<b>2300CST</b>			

Rain during the day changed to freezing rain and sleet during the evening as a very sharp cold front plowed across the region. Temperatures plunged from the lower 60s in the morning to below freezing during the early evening. The wintry precipitation, which lasted a few hours before ending, caused very icy conditions. Numerous accidents were reported, mostly vehicles sliding into ditches. One exception involved a tractor trailer rig which overturned along the Purchase Parkway between Interstate 24 and Draffenville. The parkway was closed until the accident could be cleared. Numerous accidents occurred on Interstate 24, mainly west of the Western Kentucky Parkway.

### **KYZ001>022 Fulton - Hickman - Carlisle - Ballard - Mccracken - Graves - Livingston - Marshall - Calloway - Crittenden - Lyon - Trigg - Caldwell - Union - Webster - Hopkins - Christian - Henderson - Daviess - Mclean - Muhlenberg - Todd**

<b>23</b>	<b>1500CST</b>	<b>0</b>	<b>0</b>	<b>Snow</b>
	<b>2100CST</b>			

A light snowfall, the first of the season in some areas, brought around an inch of snow and sleet. Since the road surfaces were very cold, the snow accumulated readily on pavement, and turned to ice in places. The bulk of the precipitation fell right during the evening commute time. In the region covered by the Madisonville Post of the state police, a dozen accidents occurred within 90 minutes, and two dozen people abandoned their vehicles. In Henderson, city police responded to 10 accidents during the evening.

### **KYZ018>020 Henderson - Daviess - Mclean**

<b>30</b>	<b>1800CST</b>	<b>0</b>	<b>0</b>	<b>Snow</b>
	<b>2300CST</b>			

A one to two inch snowfall resulted in snow-covered and hazardous travel conditions.

## LOUISIANA, Northeast

### **Catahoula Parish**

<b>Enterprise</b>	<b>07</b>	<b>0500CST</b>	<b>0</b>	<b>0</b>	<b>65K</b>	<b>Thunderstorm Wind</b>
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A high school sustained heavy roof damage. A barn was destroyed.

### **LAZ007>009-015>016-023-025 Morehouse - West Carroll - East Carroll - Richland - Madison - Franklin - Tensas**

<b>22</b>	<b>1800CST</b>	<b>0</b>	<b>0</b>	<b>4.1M</b>	<b>Ice Storm</b>
<b>24</b>	<b>2100CST</b>				

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## LOUISIANA, Northwest

**LAZ001>006-010>014-017>022**      **Caddo - Bossier - Webster - Claiborne - Lincoln - Union - De Soto - Red River - Bienville - Jackson - Ouachita - Sabine - Natchitoches - Winn - Grant - Caldwell - La Salle**

**22 1800CST 1 0 1M Ice Storm**  
**24 2000CST**

A shallow dome of arctic air spread across northern Louisiana while low pressure formed in the northern Gulf of Mexico pulling warm moist air northward over the top of the cold air. The result was widespread freezing rain, sleet and freezing drizzle. The ice accumulated mainly across exposed surfaces such as trees and powerlines as well as bridges and overpasses. Over a quarter million people were without power, some for over a week. I-20, I-220, and I-49 were shut down for a period. Numerous minor injuries were reported from vehicle accidents caused by slippery roads..

F23VE

## LOUISIANA, Southeast

NONE REPORTED.

## LOUISIANA, Southwest

### **Acadia Parish**

**1 E Morse 29 0930CST 0.5 10 0 0 5K Tornado (F0)**

A small tornado briefly touched down east of Morse on Highway 1115. Tin was lifted from the roof of a barn, and tossed in a nearby field. Fencing around a livestock field and an oak tree was also blown down. No injuries were reported.

## MAINE

**MEZ007>008-012>013-018>021-023>027**      **Northern Oxford - Northern Franklin - Southern Oxford - Southern Franklin - Interior York - Interior Cumberland - Androscoggin - Kennebec - Coastal York - Coastal Cumberland - Sagadahoc - Lincoln - Knox**

**01 1000EST 0 0 4K Strong Winds**  
**02 0300EST**

Strong gusty northwest winds following the passage of a cold front knocked down trees and limbs onto power lines across western Maine causing scattered power outages. In Kingfield, a tree fell on a home causing an estimated \$4000 in damages. In Lewiston, the downtown area was blacked out when a transformer exploded due to falling debris. Winds gusted to 46 mph in Brunswick, 43 mph in Portland and Rockland, 39 mph in Augusta, 37 mph in Lewiston, 35 mph in Bangor and Greenville, and 31 mph in Bar Harbor.

**MEZ001>002**      **Northwest Aroostook - Northeast Aroostook**

**06 0400EST 0 0 Moderate Snowfall**  
**1200EST**

Light to moderate snow fell across northern Maine north of warm front as an area of low pressure moved east from the Great Lakes. From 1 to 5 inches of snow fell across northern Maine.

**MEZ001>030**      **Northwest Aroostook - Northeast Aroostook - Northern Somerset - Northern Piscataquis - Northern Penobscot - Southeast Aroostook - Northern Oxford - Northern Franklin - Central Somerset - Southern Piscataquis - Central Penobscot - Southern Oxford - Southern Franklin - Southern Somerset - Southern Penobscot - Interior Hancock - Interior Washington - Interior York - Interior Cumberland - Androscoggin - Kennebec - Interior Waldo - Coastal York - Coastal Cumberland - Sagadahoc - Lincoln - Knox - Coastal Waldo - Coastal Hancock - Coastal Washington**

**07 1500EST 0 0 Unusual/Record Warmth**  
**2200EST**

A southwesterly flow of very mild air ahead of an approaching cold front brought an unusually warm December day to the state. Maximum temperatures for the day ranged from the mid 40s in the extreme northern part of the state to the lower 70s in the southwestern part of the state. Temperatures throughout most of the southern half of the state, including the western mountains, rose into the 60s. At the Portland Jetport, the temperature reached 71 degrees early in the afternoon just before the cold front passed through, setting a new all-time December maximum temperature record for Portland. It also marked the first time in the 58 year history of observations at the Jetport that the temperature reached 70 degrees or higher in December.

**MEZ007>030**      **Northern Oxford - Northern Franklin - Central Somerset - Southern Piscataquis - Central Penobscot - Southern Oxford - Southern Franklin - Southern Somerset - Southern Penobscot - Interior Hancock - Interior Washington - Interior York - Interior Cumberland - Androscoggin - Kennebec - Interior Waldo - Coastal York - Coastal Cumberland - Sagadahoc - Lincoln - Knox - Coastal Waldo - Coastal Hancock - Coastal Washington**

**08 1500EST 0 0 Light Snow**  
**2300EST**

A trough of low pressure caused light snow to fall throughout the state. Although the snowfall amounts were generally two inches

# Storm Data and Unusual Weather Phenomena

December 1998									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b>MAINE</b>									
			or less, extremely hazardous driving conditions developed as road surfaces, which had been warm due to record high temperatures on the 7th, dropped to or below freezing. Numerous traffic accidents were reported throughout the state, including several fatalities.						
<b>MEZ003&gt;010-015-021&gt;022-028&gt;030</b>			<b>Northern Somerset - Northern Piscataquis - Northern Penobscot - Southeast Aroostook - Northern Oxford - Northern Franklin - Central Somerset - Southern Piscataquis - Southern Penobscot - Kennebec - Interior Waldo - Coastal Waldo - Coastal Hancock - Coastal Washington</b>						
	17	1200EST			0	0			Moderate Snowfall
	18	1300EST							
<b>MEZ011-016&gt;017</b>			<b>Central Penobscot - Interior Hancock - Interior Washington</b>						
	17	1300EST			0	0			Heavy Snow
	18	1300EST							
	A low pressure center which developed off the mid-Atlantic coast on the 17th and moved slowly northeastward through the Gulf of Maine early on the 18th produced moderate to heavy snow in central Maine. Snowfall amounts ranged from about an inch in the southwestern corner of the state to 4 to 8 inches across most of northern, central, and eastern Maine.								
<b>MEZ007&gt;030</b>			<b>Northern Oxford - Northern Franklin - Central Somerset - Southern Piscataquis - Central Penobscot - Southern Oxford - Southern Franklin - Southern Somerset - Southern Penobscot - Interior Hancock - Interior Washington - Interior York - Interior Cumberland - Androscoggin - Kennebec - Interior Waldo - Coastal York - Coastal Cumberland - Sagadahoc - Lincoln - Knox - Coastal Waldo - Coastal Hancock - Coastal Washington</b>						
	22	0700EST 2300EST			1	0			Strong Winds
	Strong gusty west to northwesterly winds following the passage of a cold front brought down a few trees and limbs onto utility lines across southern Maine causing scattered outages. Winds gusted to 52 mph in Bangor; 46 mph in Portland, Augusta and Sanford; 43 mph in Bar Harbor; 41 mph in Greenville and Rockland; and 38 mph in Lewiston. A cable television worker died in Lewiston after being blown off his ladder by a strong gust of wind. M25OU								
<b>MEZ001&gt;010</b>			<b>Northwest Aroostook - Northeast Aroostook - Northern Somerset - Northern Piscataquis - Northern Penobscot - Southeast Aroostook - Northern Oxford - Northern Franklin - Central Somerset - Southern Piscataquis</b>						
	22	2000EST			0	0			Bitter Wind Chill
	23	0900EST							
	Wind chill temperatures dropped to 30 to 45 degrees below zero across northern Maine and the Maine mountains as strong northwesterly winds of 20 to 30 mph brought in cold air from Canada.								
<b>MEZ002-004&gt;005-012&gt;014-029</b>			<b>Northeast Aroostook - Northern Piscataquis - Northern Penobscot - Southern Oxford - Southern Franklin - Southern Somerset - Coastal Hancock</b>						
	27	1400EST			0	0			Moderate Snowfall
	28	1300EST							
<b>MEZ006-011-015&gt;022-024&gt;028</b>			<b>Southeast Aroostook - Central Penobscot - Southern Penobscot - Interior Hancock - Interior Washington - Interior York - Interior Cumberland - Androscoggin - Kennebec - Interior Waldo - Coastal Cumberland - Sagadahoc - Lincoln - Knox - Coastal Waldo</b>						
	27	1500EST			0	0			Heavy Snow
	28	1300EST							
	An area of low pressure moving east from the Great Lakes and a low pressure center that developed in the Gulf of Maine combined to produce moderate to heavy snow across most of the state. From 4 to 8 inches of snow fell in the southwestern part of the state, 2 to 6 inches in the mountains and foothills, and 5 to 10 inches in central sections of eastern Maine. Northern Maine received from 2 to 6 inches of snow, while coastal areas of eastern Maine got only an inch or two of snow.								
<b>MEZ011&gt;030</b>			<b>Central Penobscot - Southern Oxford - Southern Franklin - Southern Somerset - Southern Penobscot - Interior Hancock - Interior Washington - Interior York - Interior Cumberland - Androscoggin - Kennebec - Interior Waldo - Coastal York - Coastal Cumberland - Sagadahoc - Lincoln - Knox - Coastal Waldo - Coastal Hancock - Coastal Washington</b>						
	30	1900EST			0	0			Bitter Wind Chill
	31	0800EST							Temperatures
<b>MEZ001&gt;010</b>			<b>Northwest Aroostook - Northeast Aroostook - Northern Somerset - Northern Piscataquis - Northern Penobscot - Southeast Aroostook - Northern Oxford - Northern Franklin - Central Somerset - Southern Piscataquis</b>						
	30	2000EST			0	0			Extreme Windchill
	31	1300EST							
	Wind chill temperatures dropped to 45 to 65 degrees below zero across northern Maine and the Maine mountains as strong								

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	December 1998	Character of Storm
					Killed	Injured	Property	Crops	

## MAINE

northwesterly winds of 15 to 25 mph brought arctic air into the area after the passage of a cold front. Elsewhere in Maine, wind chill temperatures dropped to 25 to 40 degrees below zero.

## MARYLAND, Central

**MDZ002>004-006-009>011-013>014-016>018**

**Allegany - Washington - Frederick - Northern Baltimore - Montgomery - Howard - Southern Baltimore - Prince Georges - Anne Arundel - Charles - St. Mary'S - Calvert**

<b>01</b>	<b>0000EST</b>	<b>0</b>	<b>0</b>	<b>Drought</b>
<b>31</b>	<b>2359EST</b>			

This was the sixth month in a row that drought conditions were seen across Central and Northern Maryland. Persistent high pressure over the Southeast U.S. forced most precipitation producing low pressure systems to steer north of the region. In addition, record high temperatures baked the region during the first week of the month. Only 1.27 inches of precipitation fell at the Baltimore/Washington International Airport (BWI) in Anne Arundel County during December, 2.14 inches below normal. In the past 127 years, only one other July through December on record (1930) received less precipitation than the last half of 1998. The 6 month total at BWI Airport was only 7.06 inches, 13.66 inches below normal. The Maryland Science Center in Baltimore reported a monthly total of 1.34 inches. Other monthly precipitation totals from affected counties included 0.6 inches in Allegany, 0.7 in Washington, 0.8 in Howard, 1.1 in Carroll and Frederick, 1.8 in Charles, and 2.2 in Prince Georges.

Water reserves were greatly affected by the persistent drought. The Washington Suburban Sanitary Commission reported Patuxent River water reservoirs, major water storage for Montgomery and Prince Georges County, averaged 10 to 12 feet below normal during the month. Stream flows on all rivers within the Potomac and Shenandoah river basins averaged 85% below normal. The North Branch of the Potomac River at Cumberland in Allegany County was near record low flow. The Georges Creek in Allegany County which feeds into the Potomac River remained dry for a second straight month, forcing 2000 households and businesses to continue receiving water from a temporary pipeline linked to the Frostburg flow. The Maryland Department of Environment declared a drought warning on December 16th, citing South Central Maryland as the driest area in the state. A statewide ban on open burning remained in effect across the entire state through mid month because of extreme fire danger. The ban remained in effect across Washington, Frederick, and Allegany Counties through the end of December.

**MDZ009>011-013>014**

**Montgomery - Howard - Southern Baltimore - Prince Georges - Anne Arundel**

<b>23</b>	<b>1500EST</b>	<b>0</b>	<b>0</b>	<b>Winter Weather</b>
<b>24</b>	<b>0400EST</b>			

A cold front with northwest winds gusting to 40 MPH swept across Maryland on the 22nd of December. These winds were blamed for temporary power outages for 4,200 customers across Central Maryland, including the Prince Georges Hospital Center. This front also ushered in sub-freezing air that set the stage for a mixed bag of precipitation the following day. On the 23rd, a weak upper level disturbance from the Gulf States moved quickly across the Mid Atlantic region, dropping between 1 and 3 inches of snow, in addition to a thin layer of ice and sleet. Baltimore/Washington International Airport (BWI) in Anne Arundel County received 3.0 inches. The combination of mixed precipitation, holiday travellers, and the first snowstorm of the season for drivers led to many traffic accidents. Interstate 95 through Central Maryland and especially near Baltimore was referred to as a "sheet of ice" during the evening rush hour of the 23rd. Law enforcement officials reported 90 accidents causing 4 injuries and 70 disabled vehicles in Baltimore County. Flight delays were also reported at BWI Airport. The Washington D.C. metropolitan area saw 70 accidents during evening rush hour on the 23rd. Interstate 97 south of Baltimore was shut down for 40 minutes early on the 24th because of a jackknifed tractor trailer. The wintry mix remained on the ground through December 25th, giving the region a rare "white Christmas".

**MDZ006>007-011-014**

**Northern Baltimore - Harford - Southern Baltimore - Anne Arundel**

<b>30</b>	<b>0900EST</b>	<b>0</b>	<b>0</b>	<b>7K</b>	<b>Strong Wind</b>
	<b>1200EST</b>				

A vigorous area of low pressure moved over Pennsylvania on the 30th, creating windy conditions across Central and Northern Maryland. Wind gusts up to 45 MPH were common during the morning. These winds knocked down tree limbs, and some of the limbs fell onto power lines. At the height of the wind event up to 14,000 customers across Central Maryland were without power. In Davidsonville (Anne Arundel County), where winds gusted up to 46 mph, a tree limb downed on Route 424 knocked out power to 7,700. The community of Pasadena (Anne Arundel County) reported 1,689 customers without power. Strong winds blew a traffic light down onto a car in Pikesville (Baltimore County). In addition, wind gusts blew water from the Conowingo Dam along the Susquehanna River near Port Deposit (Harford/Cecil County Line) onto nearby streets, requiring salt trucks to treat the affected roads.

## MARYLAND, Northeast

**MDZ008-012-015-019>020**

**Cecil - Kent - Queen Annes - Talbot - Caroline**

<b>01</b>	<b>0000EST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Unseasonably Warm</b>
<b>07</b>	<b>1800EST</b>					

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## MARYLAND, Northeast

A very strong and persistent ridge of high pressure at all levels of the atmosphere remained anchored across the western Atlantic Ocean and the Middle and South Atlantic States from November 28th through December 7th. The result was 10 consecutive days of record breaking, unseasonably warm weather across the Maryland Eastern Shore. Many locations set new all-time monthly record high temperatures for December. The two warmest days were December 6th and 7th. High temperatures both days were 77 degrees at the Baltimore-Washington International Airport and Salisbury. The high temperature in Easton on the 7th was 73 degrees. In a paradoxical scene for early December, people were buying Christmas trees with shorts on. A cold front moved through the region late in the day on the 7th and dropped temperatures closer to normal levels.

MDZ008-012-015-  
019>020

### Cecil - Kent - Queen Annes - Talbot - Caroline

**03 0900EST 0 0 0 Drought**  
**31 2359EST**

The run of unseasonably dry weather that began in July started to take its toll on water supplies throughout the Middle Atlantic States. On December 3rd the Susquehanna River Basin Commission issued a drought advisory for the river's entire 27,510 square mile drainage area in New York, Pennsylvania and Maryland. The commission urged the public and water suppliers to voluntarily conserve water, particularly indoor uses. The Susquehanna River that provides fresh water flow for the upper part of the Chesapeake Bay was at 25 percent of its normal flow for mid December. On December 15th, The Maryland Department of the Environment (MDE) issued a drought warning for all of Maryland. It advised that continued dry conditions could lead to severe water supply problems. The MDE recommended that water suppliers promote water-saving measures and that other water users (including private citizens) seek ways to reduce water consumption. Because of the continued dry weather the Maryland Department of Natural Resources ordered a statewide ban of all outdoor burning. This was rescinded in late December.

December brought another month of below normal precipitation, especially in the northern part of the Maryland Eastern Shore. On a county weighted average, monthly precipitation totals ranged from 1.0 inches in Cecil County to 3.1 inches in Talbot County. All counties had less than their normal monthly precipitation, but Kent (at 1.5 inches) and Cecil Counties received less than half of their normal (41 and 27 percent of normal respectively) monthly amount.

MDZ008-012-015-  
019>020

### Cecil - Kent - Queen Annes - Talbot - Caroline

**22 0700EST 0 0 0 Wind**  
**1900EST**

The large sea level pressure difference between a deepening low pressure system over the Canadian Maritimes and a large high pressure system over Kansas and Missouri produced peak wind gusts of around 40 mph across the Delmarva Peninsula. The highest recorded wind gust at the Baltimore-Washington International Airport was 41 mph.

MDZ008

### Cecil

**23 1600EST 0 0 0 Snow**  
**24 0500EST**

MDZ012-015-  
019>020

### Kent - Queen Annes - Talbot - Caroline

**23 1600EST 0 0 0 Wintry Mix**  
**24 1000EST**

A series of weak low pressure systems moving northeast along a slow moving cold front over the western Atlantic Ocean brought the Delmarva Peninsula its first wintry precipitation of the season. Precipitation started as snow around 5 p.m. EST on the 23rd in the northern half of the Eastern Shore and as sleet in the southern half of the Eastern Shore. The precipitation changed over to sleet as far north as Kent County overnight. Precipitation fell mainly as sleet with some freezing rain mixed in farther south. The heaviest precipitation occurred before midnight. Light snow lingered through the early morning of the 24th in Cecil County. A mixture of sleet and freezing drizzle fell into the morning of the 24th farther south before the last low pressure system pulled far enough offshore to end the precipitation. The heaviest accumulations occurred in Cecil County where precipitation fell mainly as snow. Farther south accumulations were 1.5 inches or less. In Cecil County accumulations included 4.3 inches in Cecilton and 3.0 inches in Elkton. This first wintry precipitation of the season caused many accidents, mainly fender benders during the evening of the 23rd.

MDZ008-012-015-  
019>020

### Cecil - Kent - Queen Annes - Talbot - Caroline

**30 0700EST 0 0 0 Wind**  
**1800EST**

For the second time in about a week, strong winds buffeted the Delmarva Peninsula. The difference in surface pressure between a deepening low pressure system over the Canadian Maritimes and a high pressure system over Illinois and Missouri produced peak wind gusts during the daylight hours of 40 to 45 mph in most areas. The highest wind gust at the Baltimore-Washington International Airport was 46 mph.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## MARYLAND, Northeast

**MDZ008-012-015-019>020**      **Cecil - Kent - Queen Annes - Talbot - Caroline**

**31      2359EST**      **0      0      0**      **Unseasonably Warm And Dry**  
 December brought another month of below normal precipitation, especially in the northern part of the Maryland Eastern Shore. On a county weighted average, monthly precipitation totals ranged from 1.0 inches in Cecil County to 3.1 inches in Talbot County. All counties had below normal monthly precipitation, but Kent (at 1.5 inches) and Cecil Counties received less than half of their normal (41 and 27 percent of normal respectively) amount. December's temperature averaged between 4 and 5 degrees above normal and ranked as one of the ten warmest Decembers on record at most climatological stations.

## MARYLAND, South

**MDZ021>025**      **Dorchester - Wicomico - Somerset - Inland Worcester - Maryland Beaches**

**23      1400EST**      **0      0      5M**      **Ice Storm**  
**25      0500EST**

A major ice storm affected the Lower Maryland Eastern Shore from Wednesday, December 23rd into Friday, December 25th. A prolonged period of freezing rain and sleet resulted in ice accumulations of one quarter inch /0.25/ to three quarters inch /0.75/ in many locations. The heavy ice accumulations on trees and power lines caused numerous power outages across the region. Many accidents occurred due to slippery road conditions, especially bridges and overpasses. Many secondary roads were impassable due to fallen tree limbs and in a few cases, whole trees.

## MARYLAND, West

NONE REPORTED.

## MASSACHUSETTS, Central and East

**MAZ002>024**      **Western Franklin - Eastern Franklin - Northern Worcester - Western Middlesex - Western Essex - Eastern Essex - Western Hampshire - Western Hampden - Eastern Hampshire - Eastern Hampden - Southern Worcester - Western Norfolk - Southeast Middlesex - Suffolk - Eastern Norfolk - Northern Bristol - Western Plymouth - Eastern Plymouth - Southern Bristol - Southern Plymouth - Barnstable - Dukes - Nantucket**

**01      0800EST**      **0      3      10K**      **Strong Winds**  
**1800EST**

**MAZ005-013**      **Western Middlesex - Western Norfolk**

**01      0936EST**      **0      0**      **High Wind (G55)**  
**0938EST**

Strong west to northwest winds occurred in the wake of a cold front associated with an intense low pressure system moving into Quebec. The only reported damage was just after noon in Holbrook, in Norfolk County, when strong winds blew the roof off a warehouse sending debris crashing into a neighboring body shop. The four by eight section of roof fell on three people and totalled a car. The peak wind gusts were generally between 40 and 55 mph, but the strongest gusts included 63 mph in Tyngsboro and 58 mph at the Blue Hill Observatory in Milton.

**MAZ004-013-015**      **Northern Worcester - Western Norfolk - Suffolk**

**07      1200EST**      **0      0**      **Record Warmth**  
**1500EST**

Unseasonably warm temperatures occurred throughout much of the state. High pressure over the western Atlantic generated an unusually warm westerly wind flow. A new record high temperature for the month of December of 72 degrees was established for Worcester at Worcester Airport. The previous record was 70 degrees on December 29, 1984. The high of 72 degrees also shattered the previous record high temperature for the date, which was 63 degrees set in 1932. In Boston, the high temperature of 76 degrees at Logan Airport also set a new record high temperature for the month of December. The previous record was 73 degrees set on December 29, 1984. The high of 76 degrees shattered the previous record high for the date, which was 66 degrees set in 1932. At Blue Hill Observatory in Milton, the high of 74 degrees set a new record high for the month of December. The previous record was 72 degrees on December 29, 1984. The high of 74 degrees also shattered the previous record high for the date, which was 62 degrees set in 1932. Incidentally, the high temperature of 61 degrees at Blue Hill Observatory on December 2 broke the previous record high of 59 degrees.

**MAZ022**

**Barnstable**

**18      0400EST**      **0      0**      **Strong Winds**  
**1800EST**

Strong northwest winds buffeted the outer portion of Cape Cod where Provincetown reported sustained winds of 30 to 35 mph with gusts as high as 45 mph for a period of about 12 hours. There were no reports of damage.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property		

December 1998

## MASSACHUSETTS, Central and East

**MAZ002>024**      **Western Franklin - Eastern Franklin - Northern Worcester - Western Middlesex - Western Essex - Eastern Essex - Western Hampshire - Western Hampden - Eastern Hampshire - Eastern Hampden - Southern Worcester - Western Norfolk - Southeast Middlesex - Suffolk - Eastern Norfolk - Northern Bristol - Western Plymouth - Eastern Plymouth - Southern Bristol - Southern Plymouth - Barnstable - Dukes - Nantucket**

22	0600EST 1900EST	0	0	Strong Winds
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**MAZ013**      **Western Norfolk**

22	1400EST	0	0	High Wind (G54)
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The passage of a strong cold front brought gusty northwest west to northwest winds and an end to unseasonably mild temperatures. Peak wind gusts reached 45 to 55 mph across the higher elevations as well as in eastern Massachusetts, including Cape Cod, but a peak gust of 62 mph was reported at the Blue Hill Observatory in Milton. Some of the higher gusts reported include 56 mph at Sandwich, 50 mph at Winthrop, 48 mph at Worcester, 47 mph at Pocasset, and 46 mph at Falmouth and Plymouth. There were no reports of damage.

**MAZ014>016**      **Southeast Middlesex - Suffolk - Eastern Norfolk**

22	2030EST 2230EST	0	0	Snow Squalls
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Sudden snow squalls near the beginning of the evening rush hour in the Greater Boston area brought a dusting to an inch of snow which quickly iced area roads. Multiple car accidents occurred on several bridges. Scores of skidding accidents resulted in gridlock on a number of streets in and around the City of Boston. There were also several serious accidents on the Expressway. This event set a record for the latest date of the first measurable snowfall in any season in the Greater Boston area.

**MAZ018>023**      **Western Plymouth - Eastern Plymouth - Southern Bristol - Southern Plymouth - Barnstable - Dukes**

24	0000EST 1200EST	0	0	Heavy Snow
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A low pressure system intensified as it moved across the offshore waters during the early morning hours. This storm system brought the heaviest snowfall to southeast coastal Massachusetts, where the snow lasted nearly 10 hours. The northern fringe of the snow reached the northern and northwest suburbs of Boston. The greatest snowfall reported was over 9 inches over the south part of the town of Plymouth. Other totals of 6 inches or more included 8 inches in downtown Plymouth, Provincetown, and Truro; 7.5 inches in Cataumet; 7 inches in Eastham, Sandwich, and Whitehorse Beach in Plymouth; 6.5 inches in Pocasset and West Tisbury on Martha's Vineyard, and also in Somerset; 6.2 inches in Carver and Fairhaven; and 6.0 inches in Bridgewater, New Bedford, and West Wareham.

**MAZ002>004-008>011**      **Western Franklin - Eastern Franklin - Northern Worcester - Western Hampshire - Western Hampden - Eastern Hampshire - Eastern Hampden**

29	2100EST	0	0	Heavy Snow
30	0300EST			

A low pressure system passing southeast of Cape Cod brought heavy snowfall of up to 7 inches to the highest elevations in Franklin, Hampshire, Hampden, and northern Worcester Counties. Some of the highest totals reported include 7.0 inches in Phillipston and Tully Lake, 6.6 inches in Westfield, 6.5 inches in Goshen, and 6.0 inches in Belchertown.

**MAZ005>007-012>024**      **Western Middlesex - Western Essex - Eastern Essex - Southern Worcester - Western Norfolk - Southeast Middlesex - Suffolk - Eastern Norfolk - Northern Bristol - Western Plymouth - Eastern Plymouth - Southern Bristol - Southern Plymouth - Barnstable - Dukes - Nantucket**

30	1200EST 2300EST	0	0	Strong Winds
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**MAZ013**      **Western Norfolk**

30	1748EST	0	0	High Wind (G52)
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A period of strong northwest winds occurred in eastern and southeastern Massachusetts in the wake of an intensifying storm system northeast of Cape Cod, which brought down arctic air into southern New England along with bitterly cold wind chills. Many areas reported gusts of 40 to 50 mph, with a peak gust of 60 mph at the Blue Hill Observatory in Milton. Some of the other higher gusts included 53 mph at Provincetown, 51 mph at Rockport and Nantucket, 50 mph at Sharon, 49 mph at Sharon, 48 mph at Orleans, 47 mph at Winthrop, and 46 mph at Pocasset. There were no reports of damage.

## MASSACHUSETTS, West

**MAZ001**      **Berkshire**

02	1500EST	0	0	Record Warmth
07	1700EST			

The beginning of December was a period of record warmth across the Berkshires. An area of strong high pressure off the Mid-Atlantic coast produced a persistent south to southwesterly flow. From December 2 through 7, temperatures averaged 10 to 15 degrees above normal.

# Storm Data and Unusual Weather Phenomena

December 1998									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Crops	Character of Storm
MASSACHUSETTS, West									
MAZ001	Berkshire								
Countywide	29 30	1200EST 0600EST			0	0			Winter Storm
A series of low pressure systems moved along a frontal boundary along the eastern seaboard to produce snow in Northwestern Massachusetts. The snow started on the morning of December 29 and ended early on December 30. Generally 3 to 6 inches of snow fell across the Berkshires, but at higher elevations 12 inches fell at Peru and 10 inches fell at Savoy.									
MICHIGAN, East									
Genesee County									
Davison	06	2300EST			0	0			Thunderstorm Wind (G52)
Lapeer County									
Lapeer	06	2305EST			0	0	2K		Thunderstorm Wind (G50)
Sanilac County									
Marlette	06	2306EST			0	0	40K		Thunderstorm Wind (G60)
Washtenaw County									
Manchester	06	2308EST			0	0	10K		Thunderstorm Wind (G52)
Lenawee County									
Devils Lake	06	2310EST			0	0	20K		Thunderstorm Wind (G52)
Livingston County									
5 N Hartland	06	2310EST			0	0	5K		Thunderstorm Wind (G52)
Sanilac County									
10 W Lexington to Lexington	06	2320EST 2330EST			0	0	3K		Thunderstorm Wind (G50)
Washtenaw County									
Ann Arbor to Ypsilanti	06	2323EST 2325EST			0	0	175K		Thunderstorm Wind (G56)
Wayne County									
2 N Plymouth to Redford	06	2333EST 2344EST			0	0	50K		Thunderstorm Wind (G61)
Oakland County									
4 E White Lake to Pontiac	06	2335EST 2338EST			0	0	6K		Thunderstorm Wind (G55)
Oakland County									
3 N Farmington to Birmingham	06	2336EST 2342EST			0	2	60K		Thunderstorm Wind (G61)
Wayne County									
Willow Run Arpt to Romulus	06	2340EST 2345EST			0	0	365K		Thunderstorm Wind (G56)
Oakland County									
Rochester Hills to Troy	06	2350EST 2351EST			0	0	10K		Thunderstorm Wind (G65)
Monroe County									
Monroe	06	2351EST			0	0	10K		Thunderstorm Wind (G50)
Wayne County									
Allen Park to Trenton	06	2353EST			0	0	70K		Thunderstorm Wind (G55)
Macomb County									
Utica to 2 E Mt Clemens	06 07	2355EST 0005EST			0	0	50K		Thunderstorm Wind (G55)
Macomb County									
Romeo	07	0000EST			0	0	2K		Thunderstorm Wind (G52)

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## MICHIGAN, East

### **St. Clair County**

#### **Port Huron**

<b>07</b>	<b>0000EST</b>			<b>0</b>	<b>0</b>	<b>10K</b>	<b>Thunderstorm Wind (G52)</b>
	<b>0015EST</b>						

The first several days of December were unseasonably warm in southeast Michigan. The warm weather culminated on the 6th, when Detroit reached a high of 69 degrees - the warmest reading ever in Detroit in December. However, a powerful cold front swung through the state late in the evening on the 6th. A thin line of showers and thunderstorms accompanied the front, moving east at about 50 mph. Many of the storms along the line produced wind damage. The result was a December severe weather episode - a rather uncommon event for Michigan. Most of the wind damage occurred immediately behind the line of convection, and the majority of the damage involved the downing of trees, large limbs, and power lines.

The majority of the severe weather occurred near or south of Interstate 69. The most notable exception to this was a swath of wind damage across southern Sanilac County, from Marlette to Lexington. Barns and silos were destroyed near Marlette, and a home was deroofed.

A more spotty damage path roughly followed I-69 from Davison to Port Huron. A National Weather Service employee estimated 60 mph wind in Davison. Limbs and power lines were downed further east, in Lapeer and Port Huron. Damage was also spotty across Livingston, Oakland, and Macomb Counties. In Oakland County, the National Weather Service office in White Lake measured a 63 mph gust. In Farmington, a home was heavily damaged when it was struck by a large evergreen. A tree fell onto a vehicle on Middlebelt Road in West Bloomfield Township, and the two occupants suffered minor injuries. In Birmingham, the walls of a construction project were blown over, while in Troy, a billboard was shredded by severe winds. The city of Utica in Macomb County was especially hard hit, with many trees and power lines downed.

Damage was a little heavier across Washtenaw and Wayne Counties. A barn was destroyed near Manchester. A 64 mph gust was measured at the University of Michigan in Ann Arbor, while Detroit Metropolitan Airport had a 60 mph gust. In between those two sites, heavy damage occurred in Ypsilanti and at nearby Willow Run Airport. Three apartments suffered extensive roof damage near Ypsilanti, and a home was damaged by a falling tree. At Willow Run Airport, many planes were tossed about, resulting in the destruction of 4 planes, and damage to another half-dozen or so. In Livonia, a metal shed was thrown into a yard two homes down from where it started. In addition, the walls of a drug store under construction were toppled. Nativity scenes were thrown about in Plymouth and Romulus. An historic elm tree lost large limbs in Lincoln Park, a nearby school suffered substantial roof damage, and a dry cleaners under construction was damaged. In Trenton, a trampoline became airborne and flew into nearby tree limbs and power lines, downing them.

Damage was isolated in the southernmost tier of counties. A tree fell on a home in Devils Lake, and an uprooted tree came crashing down onto a garage in Monroe.

**MIZ054>055-063**

### **Tuscola - Sanilac - St. Clair**

<b>17</b>	<b>2200EST</b>			<b>0</b>	<b>0</b>	<b>Heavy Snow</b>
<b>18</b>	<b>0730EST</b>					

A cold air mass covered the Great Lakes, while a trough of low pressure developed over the relatively warm water of Lake Huron. A lake effect snow band formed over central Lake Huron on the 17th, and as the wind shifted to the northeast with the passing trough, the snow band came onshore in the Thumb area. Seven inches of snow fell in Lexington (Sanilac County), while Croswell (Sanilac) received six inches. Six inches of snow also fell in northeast St Clair County, north of Port Huron. A similar lake effect snow band over Saginaw Bay also came onshore, producing six inches of snow in Akron (Tuscola). Snowfall rates with these bands were around an inch an hour.

**MIZ053**

### **Saginaw**

<b>30</b>	<b>1200EST</b>			<b>0</b>	<b>0</b>	<b>500K</b>	<b>Cold</b>
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High temperatures in the teens and lows in single digits were too much for some pipes to handle. A pipe (part of a fire suppression sprinkler system) froze and burst in Brown Hall at Saginaw Valley State University. By the time it was discovered New Years Eve, water was 3 to 4 inches deep in numerous faculty and secretarial offices. Computer equipment, furniture, and files were damaged. The time of the pipe burst is unknown.

## MICHIGAN, Extreme Southwest

### **Branch County**

#### **Coldwater**

<b>06</b>	<b>2200EST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>Thunderstorm Wind</b>
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SEVERAL TREES WERE BLOWN DOWN.

## MICHIGAN, North

**MIZ019>022-**

**027>028-030**

### **Charlevoix - Leelanau - Antrim - Otsego - Kalkaska - Crawford - Alcona**

<b>17</b>	<b>0100EST</b>			<b>0</b>	<b>0</b>	<b>Heavy Snow</b>
	<b>1700EST</b>					

Low pressure tracking across the region and lake effect snows which developed in its wake combined to produce locally heavy

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b><u>MICHIGAN, North</u></b>									
<b>MIZ008</b>									snows across the region. Accumulations of up to 8 inches were reported.
									<b>Chippewa</b>
	18	0800EST 2300EST			0	0			<b>Heavy Snow</b>
									Locally heavy lake effect snow showers produced up to 10 inches of snow across northern portions of the county.
<b>MIZ008-019&gt;022-025&gt;028-031</b>									<b>Chippewa - Charlevoix - Leelanau - Antrim - Otsego - Benzie - Grand Traverse - Kalkaska - Crawford - Manistee</b>
	21	1700EST			0	0			<b>Heavy Snow</b>
	22	2100EST							Locally heavy lake effect snows produced an average of 6 to 12 inches of accumulation across the snowbelt areas of northwest and northcentral lower Michigan. Across eastern upper Michigan accumulations of 12 to 18 inches were reported across northern portions of Chippewa county. Winds gusting to around 30 mph caused widespread blowing and drifting snows and produced near whiteout conditions at times.
<b>MIZ016&gt;017-019&gt;021</b>									<b>Emmet - Cheboygan - Charlevoix - Leelanau - Antrim</b>
	25	1800EST			0	0			<b>Heavy Snow</b>
	26	0500EST							A band of heavy lake effect snows developed in the southwest flow in advance of a cold front and upper level disturbance approaching the region. The snowband extended from Leelanau County to northern Cheboygan county. The band rapidly intensified during the late evening and early morning hours as support from the upper level disturbance and convergence in advance of the cold front increased. Snowfall rates of 2 to 3 inches per hour were reported at times beneath the band. Total accumulations ranged from 8 to 18 inches...with the highest totals generally in an area from Petoskey to Pellston in Emmet county.
<b>MIZ008-016&gt;017-019-021&gt;022-027&gt;028</b>									<b>Chippewa - Emmet - Cheboygan - Charlevoix - Antrim - Otsego - Kalkaska - Crawford</b>
	31	0800EST 2359EST			0	0			<b>Heavy Snow</b>
									Locally heavy lake effect snows produced up to 8 inches of accumulation across the snowbelt areas of northwest and northcentral lower Michigan. Across eastern upper Michigan...up to 12 inches of snow were reported across northern portions of Chippewa county.
									The heavier lake effect snow showers produced whiteout conditions at times. The whiteout conditions contributed to a 100+ vehicle accident on I-75 in Crawford county during the early afternoon hours. One fatality and several injuries were associated with the accident.
<b><u>MICHIGAN, Upper</u></b>									
<b>MIZ002-009</b>									<b>Ontonagon - Gogebic</b>
	18	0300EST			0	0			<b>Heavy Snow</b>
	19	1800EST							Arctic air flowing south behind an Alberta Clipper set up a band of lake effect snow showers across parts of western Upper Michigan. Snowfall totals included 11 inches at Rockland and at Ironwood.
<b>MIZ002&gt;003-007</b>									<b>Ontonagon - Houghton - Luce</b>
	21	0500EST			0	0			<b>Heavy Snow</b>
	22	0700EST							Low pressure moving from northern lower Michigan into eastern Ontario and Quebec produced strong northwest winds over upper Michigan that brought bitterly cold air down from Canada. The cold air flowing across the warm waters of Lake Superior set up bands of heavy lake effect snow squalls. Storm totals include 8 inches at Rockland, 10 inches at Pelkie, and 10 inches at Paradise.
<b>MIZ001-003</b>									<b>Keweenaw - Houghton</b>
	23	1100EST			0	0			<b>Heavy Snow</b>
	25	0500EST							Strong west winds pushed frigid arctic air across Lake Superior... developing a band of lake effect snow squalls that extended from the Apostle Islands, across the Keweenaw Peninsula and into central Lake Superior. The snow squalls over the Keweenaw Peninsula continued until the wind shifted to the southwest. Snowfall totals were in excess of 30 inches at Calumet and at the Houghton County airport, but exact measurements were impossible because of the blowing and drifting.
<b>MIZ001-003-006&gt;007-014</b>									<b>Keweenaw - Houghton - Alger - Luce - Schoolcraft</b>
	29	1300EST			0	0			<b>Heavy Snow</b>
	30	0100EST							A low pressure center that tracked across southern lower Michigan brought some accumulating snow to west and central upper

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## MICHIGAN, Upper

Michigan. After the low passed, strong north winds brought a blast of arctic air across Lake Superior, generating lake effect snow showers and snow squalls. Storm totals reported include 10 inches at Ahmeek, Shingleton, Pine Stump Junction and at 5 miles east of Shingleton in northwest Schoolcraft county and 12 inches at Chassell.

## MICHIGAN, West

### **Jackson County**

**Spring Arbor**      **06**      **1510EST**      **0**      **0**      **2K**      **Thunderstorm Wind**  
A weather spotter reported 2 large trees were downed in Spring Arbor.

### **Jackson County**

**Jackson**      **06**      **1515EST**      **0**      **0**      **5K**      **Thunderstorm Wind**  
The Jackson County Sheriff's Department reported 5 trees were downed in the city of Jackson.

**MIZ037>039-**

**043>045-050>051-**

**056>059-064>067-**

**071>074**

**Mason - Lake - Osceola - Oceana - Newaygo - Mecosta - Muskegon - Montcalm - Ottawa - Kent - Ionia - Clinton - Allegan - Barry - Eaton - Ingham - Van Buren - Kalamazoo - Calhoun - Jackson**

**21**      **1300EST**      **0**      **0**      **Lake Effect Snow**  
**22**      **1800EST**

The winter season's first widespread snowfall came in the form of lake effect snow showers which developed behind an arctic cold front which moved across western Lower Michigan during the afternoon and early evening hours of Monday, December 21st. Snow showers continued until the late afternoon hours of December 22nd. Snowfall totals ranged from 1 to 5 inches in the listed counties. The highest snow amounts were reported from the counties adjacent to Lake Michigan, with an average of 3 to 5 inches reported in Lake, Mason, Oceana, Muskegon, Ottawa, Allegan, and Van Buren Counties. As is typically the case in this area, the first snow of the season contributed to a dramatic increase in the reported number of traffic accidents. Most of the accidents were minor, however one fatal accident in Allegan County was blamed on hazardous road conditions. A 35-year old male was killed when he lost control of his sport utility vehicle on northbound I-196 near Saugatuck in Allegan County. The vehicle left the road and smashed into a tree. The most snow reported from this event was 5.1 inches in Allegan. Other snowfall reports included 5.0 inches in Bloomingdale (Van Buren County), 4.2 inches in Grandville (Kent County), 3.5 inches in Holland, 3.0 inches at the Kent County International Airport in Grand Rapids, 2.5 inches in Hastings (Barry County), and 1.5 inches in Big Rapids (Mecosta County).

**MIZ037-043-050**

**Mason - Oceana - Muskegon**

**29**      **1900EST**      **0**      **0**      **Lake Effect Snow**  
**30**      **1900EST**

**MIZ064-071**

**Allegan - Van Buren**

**29**      **1900EST**      **0**      **0**      **Heavy Snow**  
**30**      **0700EST**

A heavy lake effect snow band moved onshore across southwest Allegan County and western Van Buren County around 7:00 pm EST on Tuesday, December 29th. The snow band remained nearly stationary until dissipating around 5:00 am EST on December 30th. However, additional light lake effect snow showers moved across the 2 counties through the day of the 30th. In Allegan County, the heaviest snow fell across Ganges and Casco Townships, affecting the towns of Ganges, Glenn, and Kibbie. Glenn reported 6 inches of snow ending at 5:00 am EST from the snow band. In Van Buren County, the heaviest snow fell along a north-south oriented axis which extended from South Haven to Watervliet (in Berrien County). Along this axis, snowfall averaged 6 to 12 inches. Specific totals included 8 inches in South Haven and 14 inches in Covert.

Strong northerly winds brought arctic air south across the warmer waters of Lake Michigan on the night of Tuesday, December 29th and into the day of December 30th, resulting in lake effect snow showers along the immediate lake shore communities of the above-mentioned counties. One very heavy lake effect snow band (or snow squall) developed over eastern Lake Michigan and moved onshore across southwest Allegan County and western Van Buren County on the evening of the 29th and remained nearly stationary until dissipating between 5:00 and 7:00 am EST on the morning of the 30th. See above details for snowfall totals under this band. Elsewhere, snowfall totals in the listed counties averaged 1 to 3 inches. Specific snowfall reports included 4 inches in Bloomingdale (Van Buren County); 3 inches in Ludington and Scottville (Mason County); 3 miles NE of Pentwater (Oceana County), and Whitehall (Muskegon County); and 2 inches in Bangor (Van Buren County), Pullman (Allegan County), Little Sable Point (Oceana County), and North Muskegon (Muskegon County).

**MIZ056>057-**

**064>065-071**

**Ottawa - Kent - Allegan - Barry - Van Buren**

**31**      **0700EST**      **0**      **0**      **Lake Effect Snow**  
**2359EST**

Lake effect snow showers moved onshore across portions of western Lower Michigan on the morning of Thursday, December 31st, 1998. Snow showers persist through midnight. As of late Thursday evening before midnight, snowfall totals averaged 3 to 5 inches across the listed counties. Several minor traffic accidents were attributed to hazardous road conditions during the late afternoon and evening hours. Specific snowfall reports included 6 inches in Bloomingdale (Van Buren County), 4 inches in Allegan and

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Property	Crops	Character of Storm
Killed	Injured									

## MICHIGAN, West

Grandville (Kent County), 3.5 inches in Holland, 3 inches in Grand Haven and Hastings, and 2.8 inches at the Kent County International Airport in Grand Rapids.

## MINNESOTA, Central and South Central

NONE REPORTED.

## MINNESOTA, Northeast

**MNZ010-012-018>020-037** Koochiching - Northern Cook / Northern Lake - Northern Itasca - Central St. Louis - Southern Lake - Southern St. Louis / Carlton

17 0500CST 0 0 Heavy Snow  
18 1030CST

Heavy snow fell over northeastern Minnesota, generally east of International Falls and Grand Rapids and north of Duluth. Some of the heavier amounts were 8.3 inches at Marcell, 7 at Virginia, 8 at Two Harbors and at Trout Lake on the Gunflint Trail, and 6.5 at Hermantown near Duluth.

## MINNESOTA, Northwest

**MNZ001>002-004-007** West Polk - Norman - Kittson - West Marshall

18 1200CST 0 0 Blizzard  
2200CST

The second blizzard of the season hit with powerful wind speeds and light snow amounts. Whiteout conditions were reported in the Red River Valley, with a rapid improvement just east in the treed areas of northwest Minnesota. The Crookston airport reported a wind gust to 51 mph. US Highway 2 was closed from East Grand Forks to Crookston.

## MINNESOTA, Southeast

NONE REPORTED.

## MINNESOTA, Southwest

NONE REPORTED.

## MINNESOTA, West

NONE REPORTED.

## MINNESOTA, West Central

NONE REPORTED.

## MISSISSIPPI, Central

**MSZ018>019-025>053** Bolivar - Sunflower - Leflore - Grenada - Carroll - Montgomery - Webster - Clay - Lowndes - Choctaw - Oktibbeha - Washington - Humphreys - Holmes - Attala - Winston - Noxubee - Issaquena - Sharkey - Yazoo - Madison - Leake - Neshoba - Kemper - Warren - Hinds - Rankin - Scott - Newton - Lauderdale - Claiborne

22 2000CST 0 0 16.6M Ice Storm  
25 0500CST

A crippling ice storm struck the three state region of Arkansas, Louisiana, and Mississippi at one of the worst times, just before Christmas. Much of the fall and early winter season of late 1998 had been very mild for southerners. But on Tuesday December 22nd, a strong surge of shallow Arctic air drove southward and spelled a quick end to the unseasonable warmth and helped set the stage for one of winter's nasty tricks. A moist southwest flow above the cold air brought several upper level disturbances. This combination of cold air and moisture held together for several days and brought periods of freezing rain and sleet to the three state region, beginning tuesday night and not ending until Christmas morning. Up to 2 inches of ice accumulated on power lines and much of the area experienced long power outages, nearly seven days in some cases. Hardest hit was an area from northeast Louisiana to north central Mississippi where tree and power line damage was moderate to severe. The prior warmth had left most trees with a little more foliage than usual and greater potential for ice accumulation. The extra weight was more than many trees could handle and quite a few large oaks and maples split in half. Christmas travel was severely hampered for several days with motorists stranded at airports, bus stations, and truck stops. Travel did not return to normal until after Christmas in some locations. Total estimated cost of damage in the region covering southeast Arkansas, northeast Louisiana, and central Mississippi is around 23 million dollars, with most of the damage attributable to downed power lines and trees. Many counties were declared federal disaster areas. The inconvenience endured by holiday travellers and their loved ones was unaccountable.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## MISSISSIPPI, North

MSZ001>017-  
020>024

De Soto - Marshall - Benton - Tippah - Alcorn - Tishomingo - Tunica - Tate - Prentiss - Coahoma - Quitman - Panola - Lafayette - Union - Pontotoc - Lee - Itawamba - Tallahatchie - Yalobusha - Calhoun - Chickasaw - Monroe

22 2100CST 0 0 99K Ice Storm  
23 2100CST

Much of north Mississippi was hit with an ice storm. Most counties reported between 1/4 to 1/2 inch of ice on their roads with some locations in the southern part of the region reporting as much as 3 inches of ice. The ice caused numerous power outages and brought down many trees and power lines. Thousands of people in north Mississippi were without power, some for as long as one week.

## MISSISSIPPI, South

Jackson County

Pascagoula

04 0430CST 0 0 5K Thunderstorm Wind

Thunderstorm winds damaged the roofs of two homes, caused damage to a front porch of a home, and blew down a tree.

## MISSISSIPPI, Southeast

NONE REPORTED.

## MISSOURI, East

MOZ009>010-  
018>019-026>027-  
034>036-041>042-  
047>052-059>065-  
072>075-084>085-099

Scotland - Clark - Knox - Lewis - Shelby - Marion - Monroe - Ralls - Pike - Boone - Audrain - Moniteau - Cole - Osage - Callaway - Montgomery - Lincoln - Gasconade - Warren - St. Charles - Franklin - St. Louis - St. Louis (C) - Jefferson - Crawford - Washington - St. Francois - Ste. Genevieve - Iron - Madison - Reynolds

21 0000CST 0 0 Winter Storm  
22 1800CST

Winter came in with a vengeance, appropriately enough, on the 1st day of winter across Missouri. A strong cold front brought the first blast of Arctic air to the state. This was quite a shock for many people as temperatures previously in the month had been quite mild, with highs ranging from the 50s to the 70s. Light freezing drizzle, sleet and snow came in with the cold front. Roads across much of eastern Missouri became covered with a thin coating of ice by the morning rush hour on the 21st. Automobile accidents were responsible for several deaths across the area. A school bus driver was killed in St. Charles County when her bus was hit by a tractor-trailer that skidded out of control on an ice covered road south of Wright City. Fortunately the students on the bus suffered only minor injuries. Temperatures the night/morning of the 21st/22nd dropped into the single digits in most areas and only rose into the teens on the 22nd.

## MISSOURI, Lower

NONE REPORTED.

## MISSOURI, Northwest

MOZ029>032-039-  
044-054

Clay - Ray - Carroll - Chariton - Saline - Johnson - Henry

01 0000CST 0 0 Flood  
10 2359CST

Minor to moderate river flooding occurred in west central Missouri during the first ten days of December.

Big Creek  
Blairstown, MO

Flood Stage 20 ft  
Above Flood Stage 12/7 to 12/8  
Crest 23.10 ft on 12/7

South Grand River  
Urich, MO

Flood Stage 24 ft  
Above Flood Stage 12/1 to 12/8  
Crest 25.8 ft on 12/7

Wakenda Creek

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage Property	Crops	Character of Storm
					Killed	Injured			

December 1998

## MISSOURI, Northwest

Carrollton, MO

Flood Stage 20 ft  
Above Flood Stage 12/7  
Crest 21.0 ft

Crooked River  
Richmond, MO

Flood Stage 20 ft  
Above Flood Stage 12/1 to 12/4  
Crest 26.9 ft on 12/3

Blackwater River  
Valley City, MO

Flood Stage 22 ft  
Above Flood Stage 12/7  
Crest 26.7 ft

Blue Lick, MO

Flood Stage 24 ft  
Above Flood Stage 12/7 to 12/10  
Crest 26.49 ft on 12/10

Fishing River  
Mosby, MO

Flood Stage 18 ft  
Above Flood Stage 12/6 to 12/7  
Crest 19.4 ft on 12/7

Grand River  
Sumner, MO

Flood Stage 26 ft  
Above Flood Stage 12/7 to 12/8  
Crest 26.29 ft on 12/8

## MISSOURI, Southeast

**MOZ076-086>087-  
100-107>112-114**

**Perry - Bollinger - Cape Girardeau - Wayne - Carter - Ripley - Butler - Stoddard - Scott - Mississippi - New Madrid**

**01 0001CST 0 0 Unusual Warmth**  
**08 0001CST**

Unseasonably warm temperatures during the first week of December, averaging 20 to 30 degrees above normal, resulted in a substantial loss of profits for some businesses. The heating and plumbing industry was especially hard hit, including propane distributors. Other businesses, such as the outdoor construction industry, benefited from the good weather. Highs reached into the upper 60s and lower 70s most days of the week.

**MOZ076-086>087-  
100-107>112-114**

**Perry - Bollinger - Cape Girardeau - Wayne - Carter - Ripley - Butler - Stoddard - Scott - Mississippi - New Madrid**

**21 1500CST 0 0 Freezing Rain**  
**2000CST**

Rain changed to sleet and freezing rain late in the afternoon as a sharp cold front crossed the region. Temperatures plunged from the upper 50s during the early morning hours into the upper 20s by evening. The wintry precipitation lasted for a few hours, long enough to cause icy conditions. Numerous skidding accidents were reported.

**MOZ108>112-114**

**Ripley - Butler - Stoddard - Scott - Mississippi - New Madrid**

**23 1200CST 0 0 Snow**  
**2000CST**

A light snowfall, the first of the season, provided a one-inch coating to extreme southeast Missouri. Very slippery road conditions were reported, and numerous accidents caused traffic problems. Very cold road surfaces allowed the snow to stick readily to the

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## MISSOURI, Southeast

pavement, and then turn to ice in some places.

## MISSOURI, Southwest

### Jasper County

**Asbury**      **06**      **1207CST**      **0**      **0**      **30K**      **Thunderstorm Wind**  
A squall line produced very strong winds which tore the roof off of a mobile home and a flea market near Asbury in northwest Jasper County. Five power poles were also broken off about 5 feet above the ground.

### Barton County

**Boston**      **06**      **1230CST**      **0**      **1**      **45K**      **Thunderstorm Wind**  
High winds associated with a squall line destroyed a beauty salon near Boston or about 6 miles south of Lamar. One person was slightly injured with minor cuts and bruises.

**MOZ055>058-  
066>071-077>083-  
088>098-101>106**

**Benton - Morgan - Miller - Maries - Vernon - St. Clair - Hickory - Camden - Pulaski - Phelps - Barton - Cedar - Polk - Dallas - Laclede - Texas - Dent - Jasper - Dade - Greene - Webster - Wright - Newton - Lawrence - Christian - Douglas - Howell - Shannon - McDonald - Barry - Stone - Taney - Ozark - Oregon**

**20**      **0200CST**      **0**      **0**      **Winter Storm**  
**21**      **2100CST**  
Periods of light rain, freezing rain, freezing drizzle, and light snow caused numerous traffic accidents across west central, central, southwest, and south central Missouri. The most prolonged period of freezing drizzle and light snow occurred in west central and central Missouri from areas around Lamar and Nevada, MO to the Lake of the Ozarks region.

Some highlights:

- One man was killed just before dawn on 12/20/99 on Missouri Hwy 13 in St. Clair County when he lost control of his vehicle on an ice covered bridge and collided with a tractor trailer.
- One woman was killed early on 12/20/99 near Carthage in Jasper County when the car she was driving skidded out of control on an icy bridge and overturned.
- A man was killed in Joplin in Jasper County on the afternoon of 12/21 when he reportedly slipped on a patch of ice and struck his head on the front bumper of his truck.
- Hundreds of traffic accidents were reported across southern Missouri.
- Precipitation amounts were light and no structural damage due to ice accumulation on trees or power lines was reported.

## MONTANA, Central

### MTZ013

**Fergus / Judith Basin**  
**01**      **0123MST**      **0**      **0**      **High Wind (G51)**  
STANFORD

### MTZ011

**Blaine / Chouteau / Hill**  
**01**      **1053MST**      **0**      **0**      **High Wind (G57)**  
CHINOOK 11S

### MTZ009

**Rocky Mountain Front**  
**01**      **1500MST**      **0**      **0**      **Winter Storm**  
**02**      **1800MST**  
MARIAS PASS TO EAST GLACIER 6 TO 8 INCHES

### MTZ011

**Blaine / Chouteau / Hill**  
**02**      **1317MST**      **0**      **0**      **High Wind (G57)**  
CHINOOK 11S

### MTZ013

**Fergus / Judith Basin**  
**02**      **1350MST**      **0**      **0**      **High Wind (G66)**  
ROY. ALSO WINDHAM 2NE G58 AT 1000...MOORE G50 AT 1000...GRASSRANGE G51 AT 1214.

### MTZ015

**Gallatin / Madison**  
**02**      **1400MST**      **0**      **0**      **High Wind (G57)**  
NORRIS HILL

### MTZ014

**Broadwater / Jefferson / Meagher / Central And Southern Lewis And Clark**  
**03**      **0500MST**      **0**      **0**      **Heavy Snow**  
**1800MST**

# Storm Data and Unusual Weather Phenomena

December 1998									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b>MONTANA, Central</b>									
MTZ015	MARTINSDALE 6 INCHES...WHITE SULPHUR SPRINGS 8 INCHES								
	<b>Gallatin / Madison</b>								
	03	0500MST 1300MST			0	0			Heavy Snow
MTZ008	WEST YELLOWSTONE AND ENNIS 6 INCHES...VIRGINIA CITY 8 INCHES								
	<b>Beaverhead</b>								
	03	1000MST 1800MST			0	0			Heavy Snow
MTZ008	WISDOM 15 INCHES...JACKSON 10 INCHES...WISE RIVER 11 INCHES...DILLON 8 INCHES								
	<b>Beaverhead</b>								
	03	1600MST			0	0			Heavy Snow
MTZ015	WISDOM 15 INCHES...LAKEVIEW 10 INCHES...GRANT 13 INCHES.								
	<b>Gallatin / Madison</b>								
	03	1600MST			0	0			Heavy Snow
MTZ009	BOZEMAN 8S 15 INCHES...BIG SKY 9 INCHES.								
	<b>Rocky Mountain Front</b>								
	10	0600MST			0	0			High Wind (G68)
MTZ011	BROWNING...HEART BUTTE G66 AT 0100								
	<b>Blaine / Chouteau / Hill</b>								
	13	0742MST			0	0			High Wind (G51)
MTZ011	CHINOOK 11S								
	<b>Blaine / Chouteau / Hill</b>								
	14	0816MST			0	0			High Wind (G57)
MTZ010	CHINOOK 11S...FT BELKNAP G50.								
	<b>Eastern Glacier / Eastern Pondera / Toole / Liberty</b>								
	16	2200MST			0	0			High Wind (G57)
MTZ011	17 1800MST								
	GALATA...CTB AWOS G52 12/16/98 2200								
	<b>Blaine / Chouteau / Hill</b>								
MTZ012	17 0200MST								
	1800MST								
	CHINOOK 11S AT 0242...INVERNESS G55 AT 1100...FT BELKNAP G55 AT 1100...GERALDINE G61 AT 0300								
MTZ013	<b>Cascade / Eastern Teton</b>								
	17	0400MST			0	0	5K		High Wind (G66)
	1800MST								
MTZ013	14SE BELT AT 1030...GTF ULTIMETER G54...CASCADE 5S G55.								
	<b>Fergus / Judith Basin</b>								
	17	0400MST			0	0			High Wind (G76)
MTZ009	1800MST								
	ROY AT 1154...DRY BLOOD AND DENTON G50 AT 1200...WINDHAM G56 AT 1030...STANFORD G55 AT 0821.								
	<b>Rocky Mountain Front</b>								
MTZ010	17 1500MST								
	HEART BUTTE								
	<b>Eastern Glacier / Eastern Pondera / Toole / Liberty</b>								
MTZ009	17 2200MST								
	18 1200MST								
	GOLDBUTTE 7N 6 INCHES								
MTZ009	<b>Rocky Mountain Front</b>								
	18	0400MST			0	0			Blizzard
	1800MST								
BROWNING G35 THROUGH NOON WITH ZERO VISIBILITY									

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b><u>MONTANA, Central</u></b>									
<b>MTZ010</b>	<b>Eastern Glacier / Eastern Pondera / Toole / Liberty</b>								
	18	0400MST 1800MST			0	0			Blizzard
	VISIBILITY LESS THAT 200 FEET CONRAD AND SHELBY...R0AD CLOSED BROWNING TO SHELBY								
<b>MTZ008</b>	<b>Beaverhead</b>								
	25	1600MST			0	0			Heavy Snow
	26	1200MST							
	WISE RIVER 6 INCHES								
<b>MTZ009</b>	<b>Rocky Mountain Front</b>								
	25	1600MST			0	0			Winter Storm
	26	1200MST							
	MARIAS PASS TO EAST GLACIER 6 TO 12 INCHES								
<b>MTZ011</b>	<b>Blaine / Chouteau / Hill</b>								
	25	1600MST			0	0			Heavy Snow
	26	1200MST							
	WARRICK 13 INCHES...ILIAD 6 INCHES								
<b>MTZ012</b>	<b>Cascade / Eastern Teton</b>								
	26	0400MST 1200MST			0	0			High Wind (G56)
	MILLEGAN AT 0717.								
<b>MTZ013</b>	<b>Fergus / Judith Basin</b>								
	26	0400MST 1200MST			0	0			High Wind (G66)
	ROY AT 0800...JUDITH GAP G54 AT 1000.								
<b>MTZ009</b>	<b>Rocky Mountain Front</b>								
	27	1600MST			0	0			Winter Storm
	28	0800MST							
	ST MARY 10 INCHES...EAST GLACIER 6 INCHES.								
<b>MTZ013</b>	<b>Fergus / Judith Basin</b>								
	27	2200MST			0	0			High Wind (G52)
	28	1800MST							
	UTICA AT 2200 12/27/98								
<b>MTZ011</b>	<b>Blaine / Chouteau / Hill</b>								
	27	2200MST			0	0			Heavy Snow
	28	0400MST							
	6 TO 8 INCHES IN THE HAVRE AREA....ILIAD 8 INCHES.								
<b>MTZ009</b>	<b>Rocky Mountain Front</b>								
	29	0500MST 2200MST			0	0			Heavy Snow
	EAST GLACIER 10 INCHES								
<b><u>MONTANA, East</u></b>									
<b>MTZ017&gt;024</b>	<b>Valley - Daniels - Sheridan - Roosevelt - Petroleum - Garfield - McCone - Richland</b>								
	04	0600MST 2100MST			0	0			Heavy Snow
	Up to 11 inches of snow accumulated in portions of northeast Montana. The snow began over the area during the early morning hours and lasted into the evening. The heaviest snow was in a narrow band from Wolf Point to Medicine Lake. Snowfall reports were as follows: Medicine Lake: 11", Wolf Point: 10", Poplar: 8", Oswego: 7", Flat Willow: 6", Jordan: 6", Plentywood: 6" and Scobey: 6". Heavy snow was also reported in northern McCone County and northern Richland County.								
<b>MTZ016&gt;017-021&gt;023</b>	<b>Phillips - Valley - Petroleum - Garfield - McCone</b>								
	29	1800MST			0	0			Winter Storm
	30	0900MST							
	A winter storm tracking through northeast Montana brought heavy snow and freezing rain. The heaviest snow band affected an area from Malta to Opheim south through Glasgow. To the south and west of the heavy snow band, freezing rain caused ice to accumulate on roads and other exposed surfaces. U.S. Highway 191 was closed south of Malta for three hours due to the ice and extremely reduced visibility in blowing snow. The highest snowfall total was recorded in Glasgow at 6.8 inches.								

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
December 1998									
<b>MONTANA, South</b>									
<b>MTZ028</b>	<b>Wheatland</b>								
	<b>02</b>	<b>0400MST</b>			<b>0</b>	<b>0</b>	<b>30K</b>		<b>High Wind (G64)</b>
		<b>1400MST</b>							
	Strong southwest winds developed along a strong surface pressure gradient in the Upper Yellowstone Valley. Livingston reported gusts up to 75 mph. Several signs were damaged, and a mobile home was destroyed as it was being transported on I-90 near Livingston.								
<b>MTZ028&gt;029-034</b>	<b>Wheatland - Musselshell - Stillwater</b>								
	<b>03</b>	<b>1500MST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>04</b>	<b>1300MST</b>							
	A strong winter storm moved slowly through Southern Montana from the afternoon of December 3 through midday on December 4. This storm produced heavy snowfalls in portions of South Central Montana. Livingston set a new daily record for snowfall on the fourth with 16.4 inches. This broke the previous record of 15.0 inches set on December 23, 1955. The Livingston airport picked up a total of 21.2 inches of snowfall from this storm. A spotter 15 miles northeast of Livingston received 29 inches of snowfall. In Sweet Grass County, Big Timber received 12 inches of snow. In Wheatland County, Shawmut received 11 and Harlowton 9 inches. In Stillwater County, Nye received 18 inches and Columbus 5 inches. In Carbon County, Luther picked up 6 inches and Red Lodge 3 inches. In Golden Valley County, Ryegate received 12 inches. In Musselshell County, a spotter 3 miles west of Roundup reported 8 inches while Roundup itself picked up 3 inches. The Billings area received anywhere from 2 to 4 inches of snow from this storm.								
<b>MTZ028-034</b>	<b>Wheatland - Stillwater</b>								
	<b>07</b>	<b>2200MST</b>			<b>0</b>	<b>0</b>			<b>Blizzard</b>
	<b>08</b>	<b>1000MST</b>							
	Strong pressure gradients ahead of a Pacific storm system caused gusty winds to develop in the Upper Yellowstone Valley. This combined with the record snowfall which fell across the area on December 3 and 4 to produce widespread blowing snow which reduced visibilities to near zero, and forced the closure of I-90 between Columbus and Bozeman after numerous accidents were reported.								
<b>MTZ028</b>	<b>Wheatland</b>								
	<b>17</b>	<b>0600MST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G65)</b>
		<b>1200MST</b>							
	A strong pressure gradient developed over the Upper Yellowstone Valley ahead of an Arctic cold front. As a result of this, sustained winds of 55 mph occurred at the Livingston airport.								
<b>MTZ034</b>	<b>Stillwater</b>								
	<b>17</b>	<b>1800MST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>18</b>	<b>1200MST</b>							
	Strong upslope behind an Arctic cold front produced 8 inches of snow in Red Lodge. Most of South Central Montana picked up lesser amounts.								
<b>MTZ028&gt;036-038</b>	<b>Wheatland - Musselshell - Treasure - Rosebud - Custer - Fallon - Stillwater - Yellowstone - Powder River - Big Horn</b>								
	<b>18</b>	<b>0400MST</b>			<b>0</b>	<b>0</b>			<b>Extreme Cold</b>
	<b>24</b>	<b>1200MST</b>							
	An Arctic air mass kept caused night time temperatures to drop well below zero across much of southern Montana for several days. On December 20, 15000 residences in Billings were without power for several hours and the Laurel water plant was damaged.								
<b>MTZ028</b>	<b>Wheatland</b>								
	<b>24</b>	<b>1600MST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G65)</b>
	<b>25</b>	<b>0400MST</b>							
	A strong low pressure system over northern Montana combined with high pressure over the great basin to produce strong winds over the Upper Yellowstone Valley. Livingston reported sustained winds at 51 mph with gusts to 74 mph at 900 pm on December 24.								
<b>MTZ028-034&gt;035</b>	<b>Wheatland - Stillwater - Yellowstone</b>								
	<b>26</b>	<b>0200MST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G61)</b>
		<b>1600MST</b>							
	A strong low pressure system produced strong southwest winds across South Central Montana as it tracked across the state. Livingston had sustained winds at 55 mph with gusts up to 69 mph. A missile site near Harlowton reported gusts to 63 mph, and an off-duty National Weather Service employee reported gusts up to 70 mph in Billings.								
<b>MTZ028-034&gt;035</b>	<b>Wheatland - Stillwater - Yellowstone</b>								
	<b>28</b>	<b>0500MST</b>			<b>0</b>	<b>0</b>	<b>10K</b>		<b>High Wind (G60)</b>
		<b>1700MST</b>							
	A strong low pressure system produced strong southwest winds across South Central Montana as it tracked eastward through the state. Gusts to 69 mph were reported at the Livingston airport, to 66 mph at the west end of Billings and to 61 mph at the Billings								

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated			December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property Damage	Crops	Character of Storm	

## MONTANA, South

MTZ028>038

airport. A billboard was blown down in Billings. These winds also produced blowing dust which reduced visibilities to below one mile across portions of South Central Montana, and knocked out power to the Absarokee area in Stillwater County for one hour.

**Wheatland - Musselshell - Treasure - Rosebud - Custer - Fallon - Stillwater - Yellowstone - Powder River - Carter - Big Horn**

**29 1400MST 0 0 Ice Storm**  
**30 0800MST**

A widespread area of rain spread eastward over a shallow Arctic airmass at the lower levels of the atmosphere. As a result the rain froze as it came into contact with the surface. In the Billings area alone there were 31 automobile accidents as a result of the freezing rain. Numerous roads were closed across South Central and southeastern Montana for several hours including portions of interstates 90 and 94.

## MONTANA, West

MTZ001>002-004

**Kootenai/Cabinet Region - West Glacier Region - Lower Clark Fork Region**

**02 1500MST 0 0 Heavy Snow**  
**1600MST**

Banfield Mtn (5600 feet) 11 inches of snow  
 Hand Creek (5000 feet) 8 inches of snow  
 Hawkins Lake (6400 feet) 10 inches of snow  
 Flattop Mtn (6300 feet) 16 inches of snow  
 Hoodoo Basin (6000 feet) 16 inches of snow  
 Pike Creek (5900 feet) 8 inches of snow

MTZ006>007

**Bitterroot / Sapphire Mountains - Butte / Pintlar Region**

**03 0700MST 0 0 Heavy Snow**  
**04 0930MST**

Anaconda 6 inches of snow  
 Butte (Downtown) 12 inches of snow  
 Daly Creek (5781 feet) 7 inches of snow  
 Skalkaho Summit (7178 feet) 10 inches of snow  
 Saddle Mtn (7900 feet) 7 inches of snow  
 Sula 8 inches of snow  
 Butte Airport 14 inches of snow

MTZ001>002-004-006

**Kootenai/Cabinet Region - West Glacier Region - Lower Clark Fork Region - Bitterroot / Sapphire Mountains**

**27 1500MST 0 0 Heavy Snow**  
**28 0300MST**

Banfield Mtn (5600 feet) 12 inches of snow  
 Poorman Creek (5098 feet) 24 inches of snow  
 Flattop Mtn (6299 feet) 13 inches of snow  
 Hoodoo Basin (6050 feet) 7 inches of snow  
 Lookout (5121 feet) 15 inches of snow  
 Lookout Pass (6026 feet) 9 inches of snow  
 Saddle Mtn (7900 feet) 15 inches of snow  
 Warm Springs (7798 feet) 7 inches of snow  
 North Fork Jacko (6329 feet) 5 inches of snow

MTZ001>002-006>007-043

**Kootenai/Cabinet Region - West Glacier Region - Bitterroot / Sapphire Mountains - Butte / Pintlar Region - Blackfoot Region**

**29 0400MST 0 0 Heavy Snow**  
**2355MST**

Moss Peak (6781 feet) 8 inches of snow  
 Flattop Mtn (6299 feet) 9 inches of snow  
 Noisy Basin (6040 feet) 16 inches of snow  
 Stahl Peak (6030 feet) 14 inches of snow  
 Saddle Mtn (7900 feet) 6 inches of snow  
 Twin Lakes (6401 feet) 8 inches of snow  
 North Fork Jocko (6250 feet) 18 inches of snow  
 Hawkins Lake 8 inches of snow  
 Skalkaho Summit 8 inches of snow  
 Calvert Snotel 12 inches of snow  
 North Fork Elk Creek 8 inches of snow

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## NEBRASKA, Central

NONE REPORTED.

## NEBRASKA, East

NONE REPORTED.

## NEBRASKA, Extreme Northeast

NONE REPORTED.

## NEBRASKA, Extreme Southwest

NONE REPORTED.

## NEBRASKA, South Central

NEZ039>041- Valley - Greeley - Nance - Sherman - Howard - Merrick - Polk - Dawson - Buffalo - Hall - Hamilton - York -  
046>049-060>064- Gosper - Phelps - Kearney - Adams - Clay - Fillmore - Furnas - Harlan - Franklin - Webster - Nuckolls -  
072>077-082>087 Thayer

20 0000CST 0 0 0 0 Extreme Cold  
23 1800CST

After weeks of unseasonably warm weather across south-central Nebraska, a strong arctic surge brought a quick end to the warmth. Temperatures steadily declined into the single digits by the evening of the 20th as arctic air sagged south across the area. Snowfall for the event was light and ranged from 1 to 3 inches. As the cold air deepened by the morning of the 22nd, temperatures fell well below zero. The coldest morning of the season so far was on the 23rd, when temperatures dropped as low as 17 below zero with clear skies. Wind chill readings ranged from 20 to 45 below zero. The cold surge gave way to warmer weather by Christmas Day.

## NEBRASKA, West

NEZ054

Kimball

19 0800MST 0 2 23.7K 0 Icy Roads  
20 1200MST

Icy roads caused accidents across Kimball County. On the 19th, a motorist lost control of his pickup and rolled it, 2 miles north of Kimball. There were no injuries, but the vehicle was totaled. On the 20th, a driver of a car eastbound on Interstate 80, hit a dump truck which was also eastbound. Two children in the car received minor injuries. Another accident occurred 4 miles east of Kimball in which a car rear ended a dump truck. No injuries occurred in this accident.

## NEVADA, North

NVZ006-006-  
006>007-007>008-  
011-011>012-012

Humboldt - Northern Elko - Southwest And South Central Elko - White Pine - Lander/Eureka

03 1000PST 0 0 Heavy Snow  
04 0800PST

An early season winter storm dropped heavy snow over parts of Northern and East Central Nevada. 12 hour snowfall totals were as follows: 7 inches at Ruth, 5 inches at Denio, Winnemucca, Austin, Paradise Valley, Jarbidge, Contact and 4-5 inches in the Elko/Spring Creek area.

## NEVADA, South

NVZ017

Western Clark/Southern Nye

03 1934PST 0 0 High Wind (G50)

Strong gradient winds ahead of an approaching cold front resulted in a 58 mph gust recorded by Desert Rock ASOS. Wind gusts up to 63 mph were also recorded by a RAWS site in the nearby Spring Mountains.

NVZ020

Las Vegas Valley

20 1102PST 0 1 15K High Wind

A construction trailer was blown over in the northwest part of the Las Vegas Valley trapping two men inside. Winds continued to hamper rescue efforts while the fire department cut the trailer open to free the men. One of the trapped men sustained a minor shoulder injury.

NVZ020

Las Vegas Valley

22 0100PST 0 0 Extreme Cold  
0800PST

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
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## NEVADA, South

The official low temperature in Las Vegas dropped to the 20 degree mark for the first time in eight years. Many locations throughout the the Las Vegas Valley experienced temperatures in the teens for a few hours before sunrise. This relatively rare event caused widespread damage to plants and sprinkler systems around the valley. Although no official damage estimate has been made, at least a few thousand homes lost sensitive plants or received damage to sprinkler piping. Lawn and garden shops had difficulty keeping replacement parts in stock.

## NEVADA, West

NVZ004

### Western Nevada Basin And Range

03 2005PST 0 0 0 Heavy Snow  
04 0805PST

7 inches of snow overnight at Imlay, 4195 feet.

NVZ003

### Greater Reno/Carson City/Minden Area

13 1226PST 0 0 0 High Wind (G54)

Peak wind gust of 54 knots recorded at the National Weather Service Office in Reno.

NVZ003

### Greater Reno/Carson City/Minden Area

19 0001PST 1 10 150K Winter Storm  
20 1800PST

Snowfall combined with bitterly cold temperatures in Western Nevada, caused icy roadways that produced numerous automobile accidents. As many as 80-90 accidents were reported just in the Reno-Sparks urban area. A multiple car accident on Interstate 80, approximately 10 miles east of Reno resulted in one fatality and several injuries. The cold temperatures over the next several days caused many water pipes to break in residences and businesses throughout the area.

M?VE

NVZ003

### Greater Reno/Carson City/Minden Area

19 0600PST 0 0 0 Heavy Snow  
1800PST

7 inches of snow in 12 hours five miles south of Carson City, elevation 4500 feet.

NVZ003

### Greater Reno/Carson City/Minden Area

19 2046PST 0 0 0 Heavy Snow  
20 2046PST

Storm total of 8 inches of snow near Topaz Lake, elevation 5047.

## NEW HAMPSHIRE, North and Central

NHZ001>010-  
013>014

### Northern Coos - Southern Coos - Northern Grafton - Northern Carroll - Southern Grafton - Southern Carroll - Sullivan - Merrimack - Belknap - Strafford - Interior Rockingham - Coastal Rockingham

01 1000EST 0 0 Strong Winds  
1800EST

Strong gusty northwest winds following the passage of a cold front knocked down trees and limbs onto power lines across central and southeastern New Hampshire causing scattered power outages. Winds gusted to 46 mph in Portsmouth, 44 mph in Laconia, 43 mph in Concord and Manchester, 40 mph in Lebanon, and 37 mph in Berlin and North Whitefield.

NHZ001>010-  
013>014

### Northern Coos - Southern Coos - Northern Grafton - Northern Carroll - Southern Grafton - Southern Carroll - Sullivan - Merrimack - Belknap - Strafford - Interior Rockingham - Coastal Rockingham

07 0800EST 0 0 Unusual/Record Warmth  
1200EST

A southwesterly flow of very mild air ahead of an approaching cold front brought an unusually warm December day to the state. Maximum temperatures for the day ranged from the lower 70s in the southeastern part of the state to the 60s elsewhere. At the airport in Concord, the temperature reached 73 degrees during the late morning just before the cold front passed through. This temperature set a new all-time December maximum temperature record for Concord. It also marked the first time in the history of observations at Concord that the temperature reached 70 degrees or higher in December.

NHZ001>010-  
013>014

### Northern Coos - Southern Coos - Northern Grafton - Northern Carroll - Southern Grafton - Southern Carroll - Sullivan - Merrimack - Belknap - Strafford - Interior Rockingham - Coastal Rockingham

08 1500EST 0 0 Light Snow  
2200EST

A trough of low pressure caused light snow to fall throughout the state. Although the snowfall amounts were generally two inches or less, extremely hazardous driving conditions developed as road surfaces, which had been warm due to record high temperatures on the 7th, dropped to or below freezing. Numerous traffic accidents were reported throughout the state.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
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## NEW HAMPSHIRE, North and Central

**NHZ001>010-013>014**      **Northern Coos - Southern Coos - Northern Grafton - Northern Carroll - Southern Grafton - Southern Carroll - Sullivan - Merrimack - Belknap - Strafford - Interior Rockingham - Coastal Rockingham**

22      0700EST      0      0      **Strong Winds**  
2200EST

Strong gusty winds to northwesterly winds following the passage of a cold front brought down a few trees and limbs onto utility lines across New Hampshire causing scattered outages. Winds gusted to 47 mph in Laconia, 46 mph in Concord and Portsmouth, 45 mph in Whitefield, 44 mph in Berlin and Lebanon, and 43 mph in Manchester.

**NHZ001>002**      **Northern Coos - Southern Coos**

22      2000EST      0      0      **Bitter Wind Chill**  
23      0100EST      **Temperatures**

Wind chill temperatures dropped to 25 to 30 degrees below zero across northern New Hampshire as strong northwesterly winds of 20 to 30 mph brought in cold air from Canada.

**NHZ004-008>010-013**      **Northern Carroll - Merrimack - Belknap - Strafford - Interior Rockingham**

29      1300EST      0      0      **Moderate Snowfall**  
30      0700EST

**NHZ006**      **Southern Carroll**

29      1400EST      0      0      **Heavy Snow**  
30      0700EST

An area of low pressure moving east from the Great Lakes and a low pressure center that developed in the Gulf of Maine combined to produce 4 to 7 inches of snow over sections of southeastern New Hampshire.

**NHZ001>010-013>014**      **Northern Coos - Southern Coos - Northern Grafton - Northern Carroll - Southern Grafton - Southern Carroll - Sullivan - Merrimack - Belknap - Strafford - Interior Rockingham - Coastal Rockingham**

30      1600EST      0      0      **Bitter Wind Chill**  
31      0800EST      **Temperatures**

Wind chill temperatures dropped to 30 to 45 degrees below zero across New Hampshire as strong northwesterly winds of 15 to 25 mph brought arctic air into the area following the passage of a cold front.

## NEW HAMPSHIRE, Southern

**NHZ011>012**      **Cheshire - Hillsborough**

29      2200EST      0      0      **Heavy Snow**  
30      0400EST

A low pressure system passing southeast of Cape Cod brought snowfall totaling 4 to 8 inches to Cheshire and Hillsborough Counties. Totals of 6 inches or more included 7.6 inches in New Ipswich, 7.0 inches in Frankestown and Jaffrey, and 6.3 inches in Troy.

## NEW JERSEY, Northeast

NONE REPORTED.

## NEW JERSEY, South and Northwest

**NJZ001-007>010-012>026**      **Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Eastern Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May - Eastern Cape May - Eastern Atlantic - Eastern Ocean**

01      0000EST      0      0      0      0      **Unseasonably Warm**  
07      1800EST

A very strong and persistent ridge of high pressure at all levels of the atmosphere remained anchored across the western Atlantic Ocean and the Middle and South Atlantic States from November 28th through December 7th. The result was 10 consecutive days of record breaking, unseasonably warm weather across New Jersey. Many locations set new all-time monthly record high temperatures for December. The warmest days were December 4th and 7th. December 7th was the warmest December day ever for the state of New Jersey since records were started in 1895. The highest temperatures during this warm spell included 78 degrees in Red Bank (Monmouth County) and Toms River (Ocean County), 77 degrees at the Atlantic City International Airport in Pomona, in Millville (Cumberland County), in Belle Mead (Somerset County) and New Brunswick (Middlesex County), 76 degrees in Cape May Courthouse (Cape May County), Piney Hollow (Gloucester County) and Trenton (Mercer County), 75 degrees in Erial (Camden County), 74 degrees in Hackettstown (Warren County), Chatham (Morris County), Lumberton (Burlington County) and the Marina within Atlantic City and 73 degrees in Andover (Sussex County) and on Long Beach Island (Ocean County).

Daily record high temperatures were either set or tied at the Atlantic City International Airport on the 1st (65 degrees), 3rd (69 degrees), 4th (73 degrees) and 7th (77 degrees). The high of 77 degrees on the 7th established a new record for the month of December. The previous monthly record was 75 degrees set on December 29, 1984. Daily record highs were also set at the

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## NEW JERSEY, South and Northwest

Marina within Atlantic City on the 1st (66 degrees), 4th and 7th (both 74 degrees). The high of 74 degrees on both the 4th and 7th also established a new monthly record for December. The previous was 72 degrees set on both the 18th and 29th of December 1984. In a paradoxical scene for early December, people were buying Christmas trees with shorts on. A cold front moved through the region late in the day on the 7th and dropped temperatures closer to normal levels.

NJZ001-007>010-012>026

**Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Eastern Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May - Eastern Cape May - Eastern Atlantic - Eastern Ocean**

14	0900EST	0	0	0	Drought
31	2359EST				

The run of unseasonably dry weather that began in July started to take its toll on all parties with water concerns throughout the state. The unseasonably dry weather forced the New Jersey State Department of Environmental Protection to issue a severe forest fire warning for southern New Jersey. Campfires were completely banned in Burlington, Middlesex, Monmouth and Ocean Counties as central New Jersey reached the extreme drought stage. The state forestry service extinguished 42 small wildfires the weekend of December 5th and 6th. Grain farmers suffered serious losses of corn and late season crops.

As December continued to be unseasonably dry, even drier than the previous months, reservoir levels continued to fall. On December 14th, the Delaware River Basin Commission declared a drought warning for the 7.3 million people within its 13,539 square mile basin in Pennsylvania, New Jersey, Delaware and New York. The drought warning affected persons in Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Monmouth, Morris, Ocean, Salem, Sussex and Warren Counties. The Delaware River Basin Commission also asked people to voluntarily cut back on water usage by 15 percent. The Commission also cut back by 15 percent the amount of water New York City and New Jersey could remove from the upstream reservoirs and the river itself. The flow targets at Montague and Trenton were also reduced to 1,655 cubic feet per second and 2,700 cubic feet per second respectively. Electric utilities must make up for evaporative losses by supplementing the Delaware's flow with releases from the Merrill Creek Reservoir in Warren County. Separately on December 14th, the New Jersey State Department of Environmental Protection declared a drought warning for the entire state. On December 23rd, the Delaware River Basin Commission declared Stage Two of its drought warning. Water diversions by New York City and New Jersey were cut back an additional 15 percent in an effort to stretch existing supplies.

The drought's affects were not limited to upstream and reservoir locations. The saltwater line within the Delaware River was at River Mile 85, or about 3 miles upstream from Chester City (Delaware County). This was 11 miles farther upstream than normal for the middle of December and increase the corrosion control costs of industries. It also could affect the sodium levels in the Cohansey Aquifer which lies under southern New Jersey and is recharged by the Delaware River. For the first time in its 46 year history, low water along the Delaware River prevented the reenactment of George Washington and his troops crossing the Delaware River. Instead they had to cross the Washington Crossing Bridge by foot on Christmas morning. The streamflow on the Maurice River in Norma (Salem County) was at its second lowest level in 67 years for December. The Flat Brook in Flatbrookville (Sussex County) was also at its second lowest level on record for December.

As dry as July through November were, for most of the state December was even drier. On a county weighted average, every county in New Jersey had less than 1.5 inches of precipitation (.9 to 1.4 inches), except in Atlantic, Cape May and Cumberland Counties where precipitation reached around 60 percent of normal. For most of the state the precipitation was around 2.5 inches below normal. The two driest counties were Hunterdon and Mercer which only received about 24 percent of their normal monthly precipitation. July through December 1998 was also the second driest six month period ever in the state of New Jersey. The average statewide precipitation total of 12.04 inches was only 52 percent of normal. The only drier six month period was November 1984 through April 1985 when a statewide average of 11.92 inches fell. Statewide precipitation records have been kept in New Jersey since 1895.

NJZ001-007>010-012>026

**Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Eastern Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May - Eastern Cape May - Eastern Atlantic - Eastern Ocean**

22	0700EST	0	0	0	Wind
	1900EST				

The large sea level pressure difference between a deepening low pressure system over the Canadian Maritimes and a large high pressure system over Kansas and Missouri produced peak wind gusts of around 40 mph across most of New Jersey during the day on the 22nd. The highest recorded wind gusts were 56 mph at the Allaire Airport (Belmar), 47 mph in Harvey Cedars (Ocean County), 41 mph at the Atlantic City International Airport and 40 mph at the Mercer County Airport.

NJZ013>014-016>020-026

**Western Monmouth - Eastern Monmouth - Salem - Gloucester - Camden - Burlington - Western Ocean - Eastern Ocean**

23	1800EST	0	0	0	Snow
24	0500EST				

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## NEW JERSEY, South and Northwest

### NJZ021-023>025 Cumberland - Western Cape May - Eastern Cape May - Eastern Atlantic

23	1800EST	0	0	0	Wintry Mix
24	0700EST				

### NJZ022 Western Atlantic

23	1800EST	0	0	0	Heavy Snow
24	0700EST				

A series of weak low pressure systems moving northeast along a slow moving cold front over the western Atlantic Ocean brought central and southern New Jersey its first wintry precipitation of the season. Precipitation fell mainly as snow, except along coastal sections of Atlantic County, Cape May and Cumberland Counties where precipitation was mixed with or changed completely over to sleet. The snow started around 6 p.m. EST on the 23rd and changed over to sleet across far southeast New Jersey during the evening. The heaviest precipitation occurred through the evening until around midnight. Light snow lingered through the early morning of the 24th, except for a mixture of freezing drizzle and sleet fell into the morning of the 24th in far southeast New Jersey. The heaviest snowfall accumulations occurred just to the north of the transition zone to sleet across Salem, southern Gloucester, southern Camden, western Atlantic, southern Burlington and central Ocean Counties. Accumulations in this band averaged around 4 inches. Elsewhere accumulations were mainly 2 to 3 inches. Accumulations were an inch or less from Somerset County northwestward.

This first wintry precipitation of the season caused many accidents, mainly fender benders during the evening of the 23rd. There were 60 accidents alone in Camden County between 7 p.m. and 9 p.m. EST. There were also several accidents along Interstate 295 in Hamilton (Mercer County) and sixteen accidents in Dover Township (Ocean County). Several cars flipped over on the Garden State Parkway in Ocean County.

Accumulations included 5.0 inches in Folsom (Atlantic County), 4.5 inches in Tabernacle (Burlington County), 4.3 inches in Clayton (Gloucester County), 4.0 inches in Toms River (Ocean County), 3.0 inches in Holmdel (Monmouth County), 2.8 inches in Somerdale (Camden County), 2.7 inches at the Atlantic City International Airport, and 2.0 inches in Mount Holly (Burlington County), Swainton (Cape May County), Millville (Cumberland County) and Hightstown (Mercer County). The snowfall from this one storm exceeded the total for some locations for the entire last winter season. It also was the first time since 1966 that more than one inch of snow fell on one of the two days before Christmas in the greater Philadelphia Metropolitan Area.

### NJZ001 Sussex

29	0500EST	0	0	0	Winter Storm
	2100EST				

A weak low pressure system over the south Atlantic States the morning of the 29th moved northeast along the Atlantic seaboard and reached the Gulf of Maine the morning of the 30th. During the morning of the 29th, while temperatures were above freezing just above the surface, temperatures at ground level were below freezing. Freezing drizzle developed and made all untreated roads very hazardous. During the afternoon as the low moved northeast along the Eastern Seaboard, precipitation became heavier and changed over from rain to snow across Sussex County. The change to snow took longest in the southeast valleys, but by the time the precipitation ended during the evening, it had snowed in all areas. Accumulations ranged from 1 to 6 inches and included 6 inches in High Point and Wantage, 4 inches in Montague, 2 inches in Sussex and 1 inch in Newton.

### NJZ001-007>010-012>026 Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Eastern Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May - Eastern Cape May - Eastern Atlantic - Eastern Ocean

30	0700EST	0	0	0	Wind
	1800EST				

For the second time in about a week, strong winds buffeted New Jersey. The difference in surface pressure between a deepening low pressure system over the Canadian Maritimes and a high pressure system over Illinois and Missouri produced peak wind gusts during the daylight hours of around 40 mph in most areas. The highest wind gust at the Atlantic City International Airport was 41 mph.

### NJZ001-007>010-012>026 Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Eastern Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May - Eastern Cape May - Eastern Atlantic - Eastern Ocean

31	2358EST	0	0	0	Unseasonably Warm And Dry
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As dry as July through November were, for most of New Jersey, December was even drier. On a county weighted average, every county in New Jersey had less than 1.5 inches of precipitation (.9 to 1.4 inches), except in Atlantic, Cape May and Cumberland Counties where precipitation reached around 60 percent of the monthly normal. For most of the state the precipitation was around 2.5 inches below normal. The two driest counties were Hunterdon and Mercer which only received about 24 percent of their normal monthly precipitation. July through December 1998 was also the second driest six month period ever in the state of New Jersey. The average statewide precipitation total of 12.04 inches was only 52 percent of normal. The only drier six month period was November 1984 through April 1985 when a statewide average of 11.92 inches fell. Statewide precipitation records have been kept in New Jersey since 1895. December 1998 was also an unseasonably warm month and averaged between 4 and 6 degrees

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## NEW JERSEY, South and Northwest

above normal. The monthly mean temperature of 44.1 degrees at the Marina within Atlantic City was the 5th warmest December on record. It was also the 5th warmest December on record at the nearby Lehigh Valley (37.5 degrees) and Philadelphia (42.0 degrees) International Airports. The monthly mean temperature of 39.9 degrees at the Atlantic City International Airport was the 10th warmest December on record.

**NJZ001-007>010-012>026**

**Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Eastern Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May - Eastern Cape May - Eastern Atlantic - Eastern Ocean**

**31 2359EST 0 0 0 Unseasonably Warm Year**

1998 was the warmest year on record in the state of New Jersey. Records on a statewide basis have been kept since 1895. The statewide yearly mean temperature of 55.5 degrees surpassed the previous record of 54.8 degrees set in 1949. The 1998 yearly mean temperature of 58.1 degrees at nearby Philadelphia International Airport tied 1931 and 1991 as the warmest year on record. Government temperature records have been kept in Philadelphia since 1874.

## NEW MEXICO, Central and North

**NMZ001>021-026**

**Northwest Plateau - Northwest Mountains Including Jemez - Upper Rio Grande Valley - Sangre De Cristo Mountains - Northeast Highlands - Harding - Far Northeast Plains - Westcentral Mountains - Middle Rio Grande Valley - Sandia/Manzano Mountains - Central High Plains/Estancia Valley County - Conchas Lake/Guadalupe - Quay - Southwest Mountains/Upper Gila Region - Lower Rio Grande Valley - Lincoln County High Plains/Hondo Valley - Capitan/Northern Sacramento Mountains - De Baca - Chaves County Plains - Roosevelt - Curry - Guadalupe Mountains Of Chaves County**

**01 0000MST 0 0 Drought**

**31 2359MST**

Some of the driest early winter conditions in many years persisted across New Mexico during December. Ski operators either delayed openings or else were forced into extended snow making. Forest managers sighted the lack of snow cover which set the stage for high fire danger in the following spring. Several wildland fires flared and required control efforts. Ranchers bemoaned poor rangeland conditions and drying stock water supplies, while fall wheat crops struggled to survive or to germinate.

**NMZ004>005**

**Sangre De Cristo Mountains - Northeast Highlands**

**06 1800MST 0 0 Heavy Snow**

**07 1400MST**

Higher terrain above 9,000 feet across northern New Mexico received 6 to 9 inches of wet snow. Lighter amounts of 2 to 4 inches were widespread elsewhere across the northern one-third of the state or north of a line from Reserve to Tucumcari to Clayton. Some sections of Interstate Highways 25 and 40 became snow packed and icy, but in general all major state roads remained passable except east of Albuquerque where I-25 was closed between 10pm and 6am in Tijeras Canyon.

**NMZ011**

**Central High Plains/Estancia Valley County**

**28 1200MST 0 0 High Wind (G50)**

**1900MST**

Brief gusty downslope winds developed in the northwesterly flow following passage of a dry upper level trough.

## NEW MEXICO, South Central and Southwest

NONE REPORTED.

## NEW MEXICO, Southeast

**NMZ029**

**Lea**

**11 0530MST 0 0 Heavy Snow**

**1200MST**

A strong upper level storm system interacted with copious amounts of Gulf and Pacific moisture to produce a heavy snow event across portions of Southeast New Mexico and West Texas. This storm system moved from west to east across the area with snowfall amounts up to 11 inches in southern Lea County. The closest official recording station at Midland International Airport, Texas set new records for the greatest daily snowfall, the greatest single event snowfall, and the greatest monthly amount with the total of 9.75". Numerous traffic accidents were reported on icy roads with a few injuries. The heavy snowfall also resulted in loss of power for some communities.

## NEW YORK, Central

**NYZ022>025-**

**044>046-055>057-062**

**Steuben - Schuyler - Chemung - Tompkins - Cortland - Chenango - Otsego - Tioga - Broome - Delaware - Sullivan**

**01 0000EST 0 0 Drought**

**31 2359EST**

December was another very dry month across central New York. This culminated a six month period starting back in the early summer of dry conditions. Dry weather and associated drought conditions were most pronounced across the southern tier counties

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	December 1998	
					Killed	Injured	Property	Crops	Character of Storm

## NEW YORK, Central

of the state. During December, much of the region received between 1.5 and 2.0 inches of liquid equivalent precipitation. This equates to little more than half the normal precipitation for the month. Precipitation deficits for the six month period between June and December were greatest over the western Catskills, where totals ran as much as 6 to 7 inches below climatological normals. On the 14th, the Susquehanna River Basin Commission decided to issue a drought watch for much of southern New York state within the Susquehanna and Chemung river basins. This watch called for voluntary water conservation. The watch remained in effect through the end of the month.

**NYZ009-037**

### **Northern Oneida - Southern Oneida**

<b>22</b>	<b>1300EST</b>	<b>0</b>	<b>0</b>	<b>Heavy Snow</b>
<b>23</b>	<b>1000EST</b>			

The first shot of arctic air of this winter season invaded central New York on the 22nd. By that afternoon, the combination of this cold air crossing over the still relatively warm Lake Ontario waters set off bands of lake effect snow. The most intense band of snow became positioned over northern Oneida county from late in the afternoon on the 22nd into the early morning hours of the 23rd. The band occasionally migrated into central portions of the county during the overnight period. By mid-morning on the 23rd, this lake snow band had shifted back northward into far northern sections of the county, then eventually out of the area into Lewis and Jefferson counties. The highest snowfall totals for this event ran within a narrow east to west corridor from near Camden eastward to Point Rock and Stokes Hill, then to just north of Holland Patent. Accumulations averaged 6 to 12 inches. Specifically, Stokes Hill picked just over a foot of snow, while Holland Patent, Forestport, and Point Rock received 7 to 9 inches. The greater Rome vicinity picked up close to 6 inches of snow.

## NEW YORK, Coastal

NONE REPORTED.

## NEW YORK, East

**NYZ032>033-  
038>043-047>054-  
058>061-063>066**

**Northern Herkimer - Hamilton - Southern Herkimer - Fulton - Montgomery - Northern Saratoga - Warren - Washington - Schoharie - Western Schenectady - Eastern Schenectady - Southern Saratoga - Western Albany - Eastern Albany - Western Rensselaer - Eastern Rensselaer - Western Greene - Eastern Greene - Western Columbia - Eastern Columbia - Western Ulster - Eastern Ulster - Western Dutchess - Eastern Dutchess**

<b>02</b>	<b>1500EST</b>	<b>0</b>	<b>0</b>	<b>Record Warmth</b>
<b>07</b>	<b>1800EST</b>			

The beginning of December was a period of record warmth across Eastern New York. An area of strong high pressure off the Mid-Atlantic coast produced a persistent south to southwesterly flow. At the Albany International Airport record highs were established on December 2 with 66 degrees, December 3 with 58, December 4 with 63 and December 7 with 65. In the Mid Hudson Valley, temperatures reached around 70 on December 4 and 7.

### **Saratoga County**

**Wilton**

<b>08</b>	<b>2130EST</b>	<b>0</b>	<b>5</b>	<b>10K</b>	<b>Wintry Mix</b>
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A weak disturbance produced a little freezing rain and sleet across the Lake George Saratoga Region on December 8. The freezing rain produced slick roads that lead to a five car collision in the town of Wilton in Saratoga County at 3:30 PM on December 8.

**NYZ041-050**

### **Northern Saratoga - Southern Saratoga**

<b>18</b>	<b>1200EST</b>	<b>0</b>	<b>0</b>	<b>Snow</b>
	<b>1430EST</b>			

An Alberta clipper type low pressure center moved across Saratoga County and produced the first general snowfall of the season. While accumulations were light, falling temperatures overnight produced black ice and very slippery roads. As a result numerous vehicular accidents were reported between exit 10 and exit 17 of the Adirondack Northway.

**NYZ063>066**

### **Western Ulster - Eastern Ulster - Western Dutchess - Eastern Dutchess**

<b>22</b>	<b>2230EST</b>	<b>0</b>	<b>0</b>	<b>1.6K</b>	<b>Wind</b>
<b>23</b>	<b>0130EST</b>				

The passage of the season's first arctic front produced gusty winds which knocked out power to 1,100 Mid Hudson Valley residents for about 3 hours on the evening of December 22.

**NYZ039-041-048>050**

### **Fulton - Northern Saratoga - Western Schenectady - Eastern Schenectady - Southern Saratoga**

<b>22</b>	<b>2300EST</b>	<b>0</b>	<b>0</b>	<b>Snow</b>
<b>23</b>	<b>0130EST</b>			

A band of lake effect snow off Lake Ontario moved across northern portions of the Mohawk Valley and the Lake George Saratoga Region. While accumulations from this lake effect snow were relatively light, the band produced locally poor visibilities and slick roads. As a result, there were dozens of accidents on the evening of December 22. The worst accident included a six car pile-up on Union Avenue in Saratoga Springs in Saratoga County. The accident forced twenty cars off the road.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## NEW YORK, North

NYZ026

**Northern St. Lawrence**

**01 0000EST 2359EST 0 0 Unusual Warmth**

Shortly after midnight, the temperature at Massena International Airport (MSS) reached 63 degrees setting a new record high temperature. The previous record being 57 degrees, set in 1975.

NYZ026

**Northern St. Lawrence**

**07 0000EST 2359EST 0 0 Unusual Warmth**

During the early morning hours, the temperature at Massena International Airport (MSS) reached 65 degrees setting a new record high temperature. The previous record being 64 degrees, set in 1951. In addition, this also tied the all time record high temperature for the month of December, previously set on December 3rd, 1982.

NYZ026>031-  
034>035

**Northern St. Lawrence - Northern Franklin - Northeast Clinton - Southern St. Lawrence - Southern Franklin - Southwest Clinton - Western Essex - Eastern Essex**

**30 0000EST 31 2359EST 0 0 Extreme Cold**

Low pressure moved into the Canadian maritimes Wednesday (December 30th) with the associated arctic front moving across the area early Wednesday (December 30th). Very cold air was ushered in on strong winds. Snow squalls occurred across the area with between 2 and 4 inches falling in the mountains.

## NEW YORK, West

NYZ019>020

**Chautauqua - Cattaraugus**

**18 0001EST 0030EST 0 0 18K Heavy Snow**

A northwest flow of cold air across Lake Erie produced heavy snows across parts of northern Chautauqua and northwest Cattaraugus counties. The heavy snows reduced visibilities and made roads slick. Several automobile accidents were blamed on the wintry conditions. Specific snowfall reports included 10" at Forestville and 10" at South Dayton.

NYZ004>006-006-  
006>007-007-  
007>008-008-  
010>012-019>020

**Wayne - Northern Cayuga - Oswego - Jefferson - Lewis - Erie - Genesee - Wyoming - Chautauqua - Cattaraugus**

**22 1200EST 25 1700EST 0 0 161K Heavy Snow**

This first significant lake effect snowstorm of the season was a long lasting one. Arctic air surged into the region following the passage of a strong cold front. The activity off Lake Erie did subside a couple of times during the event, but only for a few hours each time. Lake snows never shut down off Lake Ontario throughout the four day event. The peak times for the event were Tuesday the 22nd--up to 8" off Lake Erie and up to 18" off Lake Ontario; Tuesday night--up to 18" off Lake Ontario; Thursday the 24th afternoon and night--off Lake Ontario up to 30" on the Tug Hill; and Friday--off Lake Erie up to 8" on the Buffalo metropolitan area. The storm totals were not overly impressive since the snow squalls oscillated across the area as winds shifted with the passage of weak troughs. The greatest amounts was 35" at Montague, with several other stations on the Tug Hill in Oswego County receiving 18-24". About 10" fell over most of Jefferson county. Southeast of Lake Erie, generally 8-12" fell in the snowbelts of southern Erie and Wyoming and northern Chautauqua and Cattaraugus counties. Other specific storm totals included: Redfield 22"; Hooker 20"; North Osceola 18"; West Monroe 19"; Fulton 18"; Fair Haven and Hannibal 15"; Alden and Perrysburg 12"; and Watertown, Redwood, Warsaw and Sinclairville 10". The heavy falling and blowing snow reduced visibilities and driving conditions became treacherous. Numerous automobile accidents (several with injuries and one fatal) were blamed on the wintry conditions. Several school districts cancelled classes giving an early start to the holiday recess.

NYZ004-010-012-  
019>020

**Wayne - Erie - Wyoming - Chautauqua - Cattaraugus**

**31 0800EST 1936EST 0 0 66K Heavy Snow**

Lake effect snow squalls developed as cold air crossed the warmer waters of the Great Lakes. The southern suburbs of Buffalo received nearly two feet of snow on New Years eve. In some communities, major roads and businesses were closed and holiday events were cancelled. Snow fell at the rate of one to two inches per hour. The snow and blowing snow created near blizzard conditions and were blamed for numerous auto accidents (one fatal in Chautauqua county). Snowfall amounts included 23" in Orchard Park; 22" in Hamburg; 21" in East Aurora; and 20" in Blasdell. The snow squalls continued into the new year.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage Property	Crops	Character of Storm
					Killed	Injured			

December 1998

## NORTH CAROLINA, Central

**NCZ007>011-021>028-038>043-073>078-083>086-088>089** **Person - Granville - Vance - Warrren - Halifax - Forsyth - Guilford - Alamance - Orange - Durham - Franklin - Nash - Edgecombe - Davidson - Randolph - Chatham - Wake - Johnston - Wilson - Stanly - Montgomery - Moore - Lee - Harnett - Wayne - Anson - Richmond - Scotland - Hoke - Cumberland - Sampson**

**23 1400EST**  
**25 0800EST**

**0 0**

**Ice Storm**

An ice storm began during the afternoon of 12/23/98 and continued through the early morning hours on 12/25/98. Most of the precipitation fell in the form of freezing rain across central North Carolina causing power outages to approximately 500,000 people sometime during the period. Nearly 90,000 people were without power in Wake County alone at 2 pm on Christmas Eve.

The most severe ice accumulations were found in a southwest to northeast band across central North Carolina. This band extended from near Albemarle in Stanly county, northeast through the Asheboro area in Randolph county, and continued northeast to Raleigh/Durham and Halifax. Accumulations from 1/2 to 1 inch of ice occurred in these areas. To the northwest, over the Winston-Salem, Greensboro, and High Point areas, the precipitation began as sleet and then turned to freezing rain. Accumulations of sleet ranged nearly an inch in some areas before changing to glaze. With temperatures in the mid 20s, this made travel conditions nearly impossible on the night of the 23rd.

From Fayetteville to Goldsboro including most of the eastern Sandhills and Coastal Plain region of the state, rain was mixed with freezing rain. Some locations saw 1/4 inch accumulations of glaze on trees and power lines which caused numerous power outages. Travel conditions were not as severe as in the Piedmont region due to the mix with rain and temperatures ranging between 31 and 35 degrees.

Early on Christmas morning, the freezing rain changed to a period of light snow over the eastern Piedmont. The snow accumulated 1 to 2 inches in spotty locations centered from Pinehurst in Moore county to Fuquay-Varina in Wake county.

## NORTH CAROLINA, Central Coastal

**NCZ095-103>104** **Carteret - Eastern Dare - Eastern Hyde**

**16 0200EST**  
**1500EST**

**0 0**

**High Wind (G84)**

A fast moving but intense N'orester brought heavy rains and very strong winds. Winds gusted to hurricane force and produced sound-side flooding at Cedar Island. Coastal flooding along the Outer Banks was not significant because of low tide, but beach erosion did occur. Some peak winds that were reported: 84 knots at Cedar Island, 70 knots at Ocracoke, and 60 knots at Kitty Hawk. Rainfall amounts of 1 to 1.5 inches were common along the coast.

## NORTH CAROLINA, Extreme Southwest

**NCZ060>061** **Cherokee - Clay**

**22 0100EST**  
**24 1159EST**

**0 0**

**Ice Storm**

Only light accumulations of ice were reported, mainly in higher mountain elevations. In the valleys, precipitation was mostly in the form of rain, with only a few icy spots on bridges.

## NORTH CAROLINA, North Coastal

**NCZ012>014-030** **Northampton - Hertford - Gates - Bertie**

**23 1400EST**  
**25 0500EST**

**0 0**

**500K**

**Ice Storm**

A major ice storm affected portions of northeast North Carolina from Wednesday, December 23rd into Friday, December 25th. A prolonged period of freezing rain and sleet resulted in ice accumulations of one quarter inch /0.25/ to one half inch / 0.50/ in some locations. Northampton County was affected the most by this storm. The ice accumulations on trees and power lines caused power outages across portions of the region. Some accidents occurred due to slippery road conditions, especially bridges and overpasses.

## NORTH CAROLINA, Northwest and North Central

**NCZ001>006-018>020** **Ashe - Alleghany - Surry - Stokes - Rockingham - Caswell - Watauga - Wilkes - Yadkin**

**23 0800EST**  
**24 1200EST**

**0 0**

**Ice Storm**

Sleet and freezing rain developed during the morning hours on the 23rd and continued into late afternoon hours. Freezing rain redeveloped overnight and continued into the late morning and early afternoon hours on the 24th. Ice accumulated from 1/4 to 1/2 inch on exposed objects in most areas. However, there was some ice accumulations around one inch. The weight of the ice downed trees limbs and power lines which resulted in numerous power outages. Some people were without power for a few days. Ice covered roads and bridges resulted in numerous traffic accidents and some injuries. A traffic accident on interstate 77 in western Yadkin County resulted in two fatalities.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## NORTH CAROLINA, South Coastal

NONE REPORTED.

## NORTH CAROLINA, Southwest

**NCZ033-048>049-052-058>059** **Avery - Madison - Yancey - Haywood - Graham - Northern Jackson**

**17 0000EST 1200EST 0 0 Snow**

Snow accumulated between 1 and 4 inches, with the exception of an isolated 6 inch amount from Soco Gap in Haywood county. A number of auto accidents resulted from the slick roads and there was at least one fatality(indirect) reported in one of the accidents along Interstate 40.

**NCZ033-035>036-048>053-055-058>059-062>064-066>068-070>071-082** **Avery - Alexander - Iredell - Madison - Yancey - Mitchell - Swain - Haywood - Buncombe - Burke - Graham - Northern Jackson - Macon - Southern Jackson - Transylvania - Polk - Rutherford - Cleveland - Gaston - Mecklenburg - Union**

**23 0900EST 24 0500EST 0 0 Freezing Rain/Sleet**

Freezing rain and some sleet developed early Wednesday morning and persisted through the morning of Christmas Eve. Some areas later received enough glaze to cause damage.

**NCZ034-037-054-056>057-065-069-072** **Caldwell - Davie - McDowell - Catawba - Rowan - Henderson - Lincoln - Cabarrus**

**23 0900EST 24 0000EST 0 0 Freezing Rain/Sleet**

Freezing rain and sleet developed early Wednesday morning and persisted through the morning of Christmas Eve. These areas would receive enough glaze by Christmas Eve morning to cause damage.

**NCZ034-037-054-056>057-065-069-072** **Caldwell - Davie - McDowell - Catawba - Rowan - Henderson - Lincoln - Cabarrus**

**24 0000EST 0700EST 0 0 Ice Storm**

Freezing rain accumulated to damaging levels around midnight and by morning there were numerous power outages reported due to downed trees and power lines. Road problems were mostly limited to bridges and overpasses.

**NCZ070>071** **Gaston - Mecklenburg**

**24 0500EST 1200EST 0 0 Ice Storm**

Freezing rain built a glaze to damaging levels by sunrise and many power outages continued to occur until late morning. Power was not restored to some places until the next morning.

**NCZ034-054>055-064>067** **Caldwell - McDowell - Burke - Transylvania - Henderson - Polk - Rutherford**

**24 2200EST 25 0300EST 0 0 Snow**

Finally after the past two day's icy mixture the atmosphere became cold enough to support snow. Light snow accumulated between 1/2 and 2 inches Christmas Eve and early Christmas morning...just enough to declare the first white Christmas in many years.

## NORTH DAKOTA, Central and West

**NDZ001>003-009** **Divide - Burke - Renville - Williams**

**04 1000CST 0 0 Heavy Snow**

A low pressure system developed over southeast Wyoming and moved east intensifying over the central plains during the late morning hours. A trough of low pressure extended into eastern Montana. Heavy snow developed along this trough in northeast Montana and spread into northwest North Dakota. Snow amounts ranged between 10 to 12 inches in a twelve hour period.

## NORTH DAKOTA, East

**NDZ006>008-014>016-024-026>030** **Towner - Cavalier - Pembina - Benson - Ramsey - Walsh - Eddy - Nelson - Grand Forks - Griggs - Steele - Traill**

**18 1200CST 2200CST 0 0 Blizzard**

The second blizzard of the winter season was much like the first. It packed the very strong winds and little snowfall. The Grand Forks airport reported a peak gust to 45 mph from the north. Interstate 29 was closed briefly due to the number of accidents reported. The NWS in Grand Forks only reported 1.2 inches of new snow for the 18th, so snow totals were quite low.

# Storm Data and Unusual Weather Phenomena

									December 1998
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property      Crops	Character of Storm	
<b><u>OHIO, East</u></b>									
<b>Carroll County</b>									
Mechanicstown	22	0215EST 0600EST			0	0	20K	Flash Flood	
Heavy rains forced Hazel Run Creek to overflow its banks. Minor flooding of several homes was reported in the Mechanicstown area.									
<b><u>OHIO, North</u></b>									
<b>Wood County</b>									
Walbridge	06	2330EST			0	0	2K	Thunderstorm Wind	
Large tree limbs were downed west of Walbridge.									
<b>Lucas County</b>									
Toledo	06	2343EST			0	0	25K	Thunderstorm Wind	
Two tractor trailers were blown over on U.S. Route 23 at U.S. Route 20.									
<b>Seneca County</b>									
Tiffin	06	2350EST			0	0	2K	Thunderstorm Wind	
Large limbs were downed southwest of Tiffin.									
<b>Wyandot County</b>									
Upper Sandusky	06	2350EST			0	0	3K	Thunderstorm Wind	
Large limbs and at least one tree were downed north of Upper Sandusky.									
<b>Hancock County</b>									
Countywide	07	0020EST			0	0	7K	Thunderstorm Wind	
Several trees and power lines were downed.									
<b>Morrow County</b>									
Mt Gilead	07	0025EST			0	0	2K	Thunderstorm Wind	
Large limbs and at least one tree were downed.									
<b>Huron County</b>									
Countywide	07	0035EST			0	0	5K	Thunderstorm Wind	
Trees were downed.									
<b>Richland County</b>									
Central Portion	07	0100EST			0	0	2K	Thunderstorm Wind	
Trees were downed near the towns of Lucas and Ontario.									
<b>OHZ013&gt;014</b>									
<b>Geauga - Ashtabula</b>									
	17	0700EST			0	0		Heavy Snow	
	18	0400EST							
Lake effect snow accumulated to eight inches in Monroe Township ( Ashtabula County) and six inches in Chardon (Geauga County).									
<b>OHZ011&gt;014</b>									
<b>Cuyahoga - Lake - Geauga - Ashtabula</b>									
	22	0100EST			0	0		Heavy Snow	
	23	0500EST							
Lake effect snow accumulated between six and eight inches in Geauga County, four to seven inches in inland Ashtabula County, and four to six inches in eastern Cuyahoga County and Lake County.									
<b>OHZ014-023</b>									
<b>Ashtabula - Trumbull</b>									
	29	2300EST			0	0	100K	Heavy Snow	
	30	1300EST							
Lake effect snow in Ashtabula County accumulated to 20 inches from Jefferson to Williamsfield, with about eight inches at the lakeshore between Geneva and the city of Ashtabula. The heavy snow also extended into Northeast Trumbull County and accumulated up to ten inches. The snow fell at a rate of two to three inches per hour for several hours. Road crews were unable to keep pace, making some roads nearly impassable during the early morning hours of the 30th.									
<b>OHZ012&gt;014</b>									
<b>Lake - Geauga - Ashtabula</b>									
	31	1500EST 2359EST			0	0	75K	Heavy Snow	
Lake effect snow began on the afternoon of December 31st and continued into the morning hours of January 1, 1999. The snow accumulated four to ten inches in Lake County and the Ashtabula Lakeshore, and four to eight inches in inland Ashtabula County. Six inches of snow accumulated across much of Geauga County. Many minor accidents were attributed to the wintry weather and resulting road conditions.									

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	December 1998	Character of Storm
					Killed	Injured	Property	Crops	

## OHIO, Northwest

### **Paulding County**

**Paulding**      **06**      **2245EST**      **0**      **0**      **50K**      **Thunderstorm Wind**  
NUMEROUS TREES AND POWER LINES BLOWN DOWN. ONE HOUSE HAD ITS ROOF BLOWN OFF.

### **Defiance County**

**3 E Defiance**      **06**      **2300EST**      **0**      **0**      **30K**      **Thunderstorm Wind**  
BARN ROOF BLOWN OFF AND BOAT WAS KNOCKED OVER BY THE STRONG WINDS.

### **Williams County**

**Bryan**      **06**      **2300EST**      **0**      **0**      **0**      **Thunderstorm Wind**  
MANY TREES AND LIMBS BLOWN DOWN.

### **Fulton County**

**Wauseon**      **06**      **2315EST**      **0**      **0**      **10K**      **Thunderstorm Wind**  
TREES AND POWER LINES WERE BLOWN DOWN.

### **Putnam County**

**Ottawa**      **06**      **2320EST**      **0**      **0**      **10K**      **Thunderstorm Wind**  
TREES AND POWER LINES WERE BLOWN DOWN ACROSS THE TOWN.

Synoptic and mesoscale conditions for December 6th...

A strong upper level disturbance ejecting out of the desert southwest early on the 6th combined with 130 knot jet stream, induced surface low pressure across western Kansas which rapidly deepened throughout the day as it moved northeastward into the southern great lakes that evening. Mid level winds were in excess of 100 knots at 500 millibars. Instability was quite limited with surface based lifted indices only around zero. However an impressive dry punch accompanied the cold front where convergence was quite strong and combined with dewpoints near 60 degrees... a line of low topped storms developed by mid evening across northern Indiana and southern Michigan and marched eastward into Ohio later in the evening. Wind gusts associated with this line of storms were estimated to be as much as 100 mph which caused extensive damage to trees, power lines and structures across many counties.

## OHIO, Southeast

**OHZ066>067-  
075>076-083>087**

**Perry - Morgan - Athens - Washington - Jackson - Vinton - Meigs - Gallia - Lawrence**

**06**      **1200EST**      **0**      **0**      **Record Warmth**  
**1800EST**

Afternoon temperatures peaked in the low and mid 70s. South Point was 76 degrees, Gallipolis 75, Marietta, McConnelsville, and Jackson all registered 74, Athens 73, and New Lexington had 72. It marked the climax of an unusual 2 week warm spell.

**OHZ085>087**

**Meigs - Gallia - Lawrence**

**21**      **1900EST**      **0**      **0**      **Wind**  
**2100EST**

Wind gusts of 35 to 45 mph occurred along a cold front. An anemometer near Willow Wood of Lawrence County recorded a 45 mph gust at 2030E.

## OHIO, Southwest

### **Auglaize County**

**St Marys**      **06**      **2327EST**      **0**      **0**      **Thunderstorm Wind (G51)**  
**2335EST**  
Winds gusted to 60 mph.

## OKLAHOMA, Eastern

**OKZ060-073**

**Tulsa - Pittsburg**

**03**      **0000CST**      **0**      **0**      **Record Warmth**  
**2359CST**

The low temperature of 60 degrees Fahrenheit at the Tulsa International Airport broke the record for being the warmest low temperature on record for this date.

The low temperature of 61 degrees Fahrenheit at the McAlester Regional Airport broke the record for being the warmest low temperature on record for this date.

**OKZ073**

**Pittsburg**

**05**      **0000CST**      **0**      **0**      **Record Warmth**  
**2359CST**

The low temperature of 63 degrees Fahrenheit at the McAlester Regional Airport broke the record for being the warmest low

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## OKLAHOMA, Eastern

temperature on record for this date.

### **Rogers County**

**6 NE Bushyhead**      **06**      **1135CST**      **0**      **0**      **7K**      **Thunderstorm Wind**  
In Chelsea, windows were blown out of six vehicles, and three trees were blown down.

### **Delaware County**

**Eucha**      **06**      **1320CST**      **0**      **0**      **Thunderstorm Wind (G52)**  
A wave of low pressure developed along a strong cold front that was moving into unseasonably warm air to bring numerous showers and isolated thunderstorms to northeast Oklahoma during the day. Two of these small low-topped thunderstorms briefly became severe during the late morning and early afternoon. The primary threat from these two isolated storms was strong damaging winds.

### **OKZ054>075**

**Osage - Washington - Nowata - Craig - Ottawa - Pawnee - Tulsa - Rogers - Mayes - Delaware - Creek - Okfuskee - Okmulgee - Wagoner - Cherokee - Adair - Muskogee - McIntosh - Sequoyah - Pittsburg - Haskell - Latimer**

**21**      **0000CST**      **0**      **0**      **Freezing Drizzle**  
**2200CST**

Drizzle developed across eastern Oklahoma on the morning of December 21. As temperatures fell below freezing to the north of an arctic cold front, the drizzle began to freeze upon contact with the ground. The resulting buildup of thin ice caused roads to become slick and hazardous. There were numerous traffic accidents and serious disruptions to holiday travel across the area. However, the ice did not become thick enough to cause loss of power or tree damage.

### **OKZ049-053-073-076**

**Pushmataha - Choctaw - Pittsburg - Le Flore**

**23**      **0000CST**      **0**      **0**      **Ice Storm**  
**2359CST**

A series of upper level disturbances moving across a shallow arctic air mass caused freezing rain to break out across far southern Oklahoma on the day before Christmas Eve. While the worst of the ice storm was further south in north Texas, the freezing rain and ice was enough to cripple travel in far southern Oklahoma at one of the busiest travel times of the year. Fortunately, the ice was not thick enough in southeast Oklahoma to cause significant power outages or tree damage.

## OKLAHOMA, Extreme Southeast

### **OKZ077**

**Mccurtain**

**22**      **1800CST**      **0**      **0**      **Ice Storm**  
**24**      **2000CST**

A shallow arctic air mass spread southward across all of southwest Arkansas while low pressure formed in the Gulf of Mexico spreading warm moist air northward over the top of the arctic air mass. This resulted in widespread freezing rain, freezing drizzle, and sleet. Overall, accumulations of ice and sleet was generally below one inch. The ice accumulated mainly across exposed surfaces such as trees, powerlines, bridges, and overpasses. Numerous power outages, a few automobile accidents, and a few downed trees were the result of the ice storm.

## OKLAHOMA, Panhandle

NONE REPORTED.

## OKLAHOMA, Western, Central and Southeast

### **OKZ004>048-050>052**

**Harper - Woods - Alfalfa - Grant - Kay - Ellis - Woodward - Major - Garfield - Noble - Roger Mills - Dewey - Custer - Blaine - Kingfisher - Logan - Payne - Beckham - Washita - Caddo - Canadian - Oklahoma - Lincoln - Grady - McClain - Cleveland - Pottawatomie - Seminole - Hughes - Harmon - Greer - Kiowa - Jackson - Tillman - Comanche - Stephens - Garvin - Murray - Pontotoc - Coal - Cotton - Jefferson - Carter - Johnston - Atoka - Love - Marshall - Bryan**

**20**      **1600CST**      **0**      **0**      **Ice Storm**  
**21**      **2200CST**

A prolonged period of light freezing drizzle or light freezing rain plagued all of western and central Oklahoma on the 20th and 21st of December producing a thin layer of ice on most roads. Precipitation began first across northern Oklahoma around 1800 CST on the 20th, and then spread southward into all of western and southern Oklahoma during the 12 hour period between 0000 CST and 1200 CST on the 21st. Several hundred traffic accidents occurred during this time with 255 occurring in the Oklahoma City metropolitan area. Across the entire state of Oklahoma there were 13 fatal traffic accidents and 100 injury related traffic accidents. Only a few locations recorded a measureable amount of precipitation, but amounts were typically under 2 or 3 hundredths of an inch. However northwest portions of Oklahoma including Ellis, Harper, Woodward, Woods, and Alfalfa Counties, did receive 1 to 2 inches of snow from late evening on the 20th through the early morning on the 21st. Many schools had to close, and numerous traffic accidents were reported.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## OKLAHOMA, Western, Central and Southeast

**OKZ024>032-037>048-050>052** Canadian - Oklahoma - Lincoln - Grady - McClain - Cleveland - Pottawatomie - Seminole - Hughes - Tillman - Comanche - Stephens - Garvin - Murray - Pontotoc - Coal - Cotton - Jefferson - Carter - Johnston - Atoka - Love - Marshall - Bryan

**23 0600CST**  
**24 0300CST**

**0 0**

**Ice Storm**

An extended period of light freezing drizzle or light freezing rain mixed with periods of light snow and light sleet affected portions of central and southern Oklahoma on most of the 23rd and early on the 24th. Another thin glaze of ice formed on most roads making for treacherous driving conditions. The most significant icing occurred across Garvin, Pontotoc, and Coal Counties, and areas farther south toward the Red River, where many locations reported several hundredths of an inch of ice. Healdton in Carter County reported 0.03 of freezing rain on the 23rd. 225 traffic accidents are known to have occurred across southern Oklahoma on the 23rd, and there was at least 1 fatal traffic accident. Many roads had to be closed for extended periods of time due to icing and/or traffic accidents.

## OREGON, Central and East

**ORZ019** Northeast Oregon

**02 0700PST**  
**1800PST**

**0 0**

**Heavy Snow**

Six inches of snow fell during the day above an elevation of 4000 feet.

**ORZ019** Northeast Oregon

**05 1600PST**  
**2200PST**

**0 0**

**Heavy Snow**

Four to six inches of new snow fell during the day.

**ORZ019** Northeast Oregon

**07 1200PST**  
**08 1430PST**

**0 0**

**Heavy Snow**

Up to 18 inches of new snow was reported near Tollgate at an elevation of 5200 feet.

**ORZ019** Northeast Oregon

**07 1300PST**  
**1800PST**

**0 0**

**High Wind (G47)**

Sustained wind of 44 to 48 mph and a peak gust of 54 mph was reported in Ladd Canyon.

**ORZ019** Northeast Oregon

**07 2000PST**  
**08 2000PST**

**0 0**

**Winter Storm**

Snow and ice closed Interstate 84 east of Pendleton for more than two hours on the afternoon of the 7th. Several vehicles were reported off the road or in the median due to the slippery conditions.

**ORZ019** Northeast Oregon

**11 0800PST**  
**1700PST**

**0 0**

**Winter Storm**

Six to eight inches of snow fell at an elevation of 5200 feet. At 4000 feet, freezing rain turned to snow at 2 PM with four inches of new snow by 5 PM.

**ORZ019** Northeast Oregon

**17 2100PST**  
**18 1200PST**

**0 0**

**Heavy Snow**

Up to eight inches of snow fell in the mountains of northeast Oregon overnight. The heaviest amount of snow fell in the southwest part of the mountains.

**ORZ016** Lower Columbia Basin

**18 0815PST**

**1 1**

**Winter Storm**

Icy roads caused a one car accident on Interstate-82 near Hermiston. The car slid off the road, rolled several times, and ejected the passenger. The driver sustained minor injuries and the passenger was pronounced dead at the scene. M39VE

**ORZ016>017-019** Lower Columbia Basin - Foothills Of The Blue Mountains - Northeast Oregon

**24 0000PST**  
**1800PST**

**0 0**

**Winter Storm**

A Christmas Eve storm brought snow, freezing rain, and cold temperatures to northeast Oregon. Icy roads were to blame for a vehicle roll over on Interstate 84 in Pendleton. Up to six inches of snow fell in the mountains and up to an inch of snow fell at the lowest elevations. Temperatures were around 20 degrees.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b><u>OREGON, Central and East</u></b>									
<b>ORZ019</b>	<b>Northeast Oregon</b>								
	<b>24</b>	<b>1800PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>25</b>	<b>0600PST</b>							
	Nine inches of new snow fell overnight with gusty wind creating blowing and drifting snow.								
<b>ORZ018&gt;019</b>	<b>Columbia Deschutes Plateau - Northeast Oregon</b>								
	<b>25</b>	<b>0600PST</b>			<b>0</b>	<b>0</b>			<b>Winter Storm</b>
		<b>2000PST</b>							
	Six to sixteen inches of snow fell on Christmas day in the mountains of northeast Oregon.								
<b>ORZ018&gt;019</b>	<b>Columbia Deschutes Plateau - Northeast Oregon</b>								
	<b>27</b>	<b>0500PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
		<b>1600PST</b>							
	Up to eight inches of new snow fell in the mountains at 5000 feet with around four inches of snow at 3500 feet. Strong wind began in the afternoon and the snow changed to rain in the lower elevations.								
<b>ORZ017</b>	<b>Foothills Of The Blue Mountains</b>								
	<b>27</b>	<b>2300PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G57)</b>
	A National Weather Service employee reported shingles ripped off his and neighbors houses in Pendleton. High wind also blew over two power poles onto a highway near Milton-Freewater. A vehicle struck the pole but, no one was hurt. The peak wind gust at the Pendleton airport was 66 mph.								
<b>ORZ019</b>	<b>Northeast Oregon</b>								
	<b>28</b>	<b>0500PST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
		<b>1000PST</b>							
	A combination of an inch of rain in 24 hours and an ice jam on Lostine creek created minor flooding near the town of Lostine.								
<b>ORZ017</b>	<b>Foothills Of The Blue Mountains</b>								
	<b>29</b>	<b>1200PST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
	<b>30</b>	<b>1600PST</b>							
	Minor field flooding was reported as water spilled over the banks of Umatilla River east of Pendleton.								
<b><u>OREGON, Northwest</u></b>									
<b>ORZ011</b>	<b>Northern Cascades</b>								
	<b>01</b>	<b>0000PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
		<b>2000PST</b>							
	The first storm of December dumped 17 inches of new snow at Timberline Lodge and 15 inches at Mt Hood Meadows on Mt Hood.								
<b>ORZ001&gt;002</b>	<b>Northern Coast - Central Coast</b>								
	<b>01</b>	<b>0400PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G61)</b>
	<b>02</b>	<b>0400PST</b>							
	December began with a powerful Pacific storm delivering high winds to the North and Central Oregon Coast. On the North Coast, Cannon Beach reported sustained winds 45 to 55 mph gusting to 68 mph while Seaside reported a gust to 62 mph. On the Central Coast, Netarts had winds 45 mph gusting to 70 mph, Sea Lion Caves 58 gusting to 68 mph, and Newport 44 gusting to 66 mph. Strongest winds were mid morning through the afternoon of the 1st.								
<b>ORZ011</b>	<b>Northern Cascades</b>								
	<b>01</b>	<b>2200PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>02</b>	<b>2300PST</b>							
	Additional heavy snow fell in the Cascades in the wake of a strong Pacific front. Reported new snow accumulations were 14 inches at Santiam Pass, 13 inches at Timberline Lodge on Mt Hood, 12 inches at Willamette Pass, and 11 inches at Mt Hood Meadows.								
<b>ORZ001&gt;002-005&gt;006</b>	<b>Northern Coast - Central Coast - Central Willamette Valley Including Salem - Southern Willamette Valley Including Eugene</b>								
	<b>02</b>	<b>0000PST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
	<b>03</b>	<b>0000PST</b>							
	Widespread minor flooding occurred after 2 to 3 inches of rain fell in Northwest Oregon December 1 and 2. Rivers were only briefly above flood stage and no injuries or major damages were reported, although some minor mudslides were reported. The rivers that exceeded flood stage included the Nehalem at Foss, Wilson near Tillamook, Siletz at Siletz, Siuslaw near Mapleton, Marys near Philomath, Luckiamute near Suver, and Tualatin near Dilley.								
<b>ORZ001</b>	<b>Northern Coast</b>								
	<b>03</b>	<b>2000PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>04</b>	<b>0800PST</b>							
	In the Northern Coast Range, 4 inches of new snow accumulated at Wilson river Highway summit and 2 inches at Sunset Summit.								

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b>OREGON, Northwest</b>									
<b>ORZ002</b>	The Coast Range Valley town of Jewell reported 2 inches of new snow also.								
	<b>Central Coast</b>								
	<b>05</b>	<b>0300PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G56)</b>
		<b>1200PST</b>							
	Winds gusted to 64 mph at Newport in the morning hours.								
<b>ORZ001</b>	<b>Northern Coast</b>								
	<b>05</b>	<b>1200PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>06</b>	<b>1200PST</b>							
	In the North Coast Range, new snow accumulations of 7 inches at Sunset Summit and 6 inches at Wilson river Highway Summit were reported.								
<b>ORZ004-011</b>	<b>Northern Willamette Valley Including Portland Metro Area - Northern Cascades</b>								
	<b>05</b>	<b>1400PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>06</b>	<b>1700PST</b>							
	Heavy snow fell in the Cascades and higher elevations in the foothills and Willamette Valley. In the cascades, 17 inches fell at Timberline Lodge and Santiam Pass, 16 inches at Willamette pass, and 13 inches at Mt Bachelor. Accumulations in the lower elevations were in the 1 to 3 inch range, causing hazardous driving conditions.								
<b>ORZ011</b>	<b>Northern Cascades</b>								
	<b>07</b>	<b>1600PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>08</b>	<b>2200PST</b>							
	A strong, wet Pacific storm dumped copious snow on the Northern Oregon Cascades in one of the heaviest dumps of a snowy month. Santiam Pass reported 22 inches of new snow, while Timberline Lodge had 20 inches, Bennett Pass 19 inches, Mt Hood Meadows 17 inches, Willamette Pass 16 inches, and Government Camp 12 inches.								
<b>ORZ002</b>	<b>Central Coast</b>								
	<b>07</b>	<b>1700PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G58)</b>
		<b>2300PST</b>							
	Winds at Sea Lion Caves gusted to 67 mph.								
<b>ORZ001</b>	<b>Northern Coast</b>								
	<b>12</b>	<b>1300PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G56)</b>
	<b>13</b>	<b>0300PST</b>							
	Another Pacific storm caused winds of 45 mph with gusts to 65 mph at Netarts, a gust to 61 mph in Seaside, and sustained winds of 55 mph at Tillamook.								
<b>ORZ001&gt;002-004&gt;006-009-011</b>	<b>Northern Coast - Central Coast - Northern Willamette Valley Including Portland Metro Area - Central Willamette Valley Including Salem - Southern Willamette Valley Including Eugene - Western Columbia River Gorge - Northern Cascades</b>								
	<b>18</b>	<b>0000PST</b>			<b>0</b>	<b>0</b>			<b>Extreme Cold</b>
	<b>24</b>	<b>0800PST</b>							
	An extensive arctic airmass spread over the entire Pacific Northwest the week before Christmas. Temperatures fell sharply beginning December 18 and were coldest around the Winter Solstice December 21. High temperatures were only in the teens and 20s then. The lowest temperatures in Northwest Oregon were in the Cascades, where overnight lows fell into the teens below zero. Light snow, less than one inch amounts, fell on the 19th and 21st, causing widespread traffic problems. Numerous accidents on Interstate 5 near the Oregon/Washington border during rush hour on the 21st caused a massive traffic jam. Plumbers were kept busy repairing frozen and burst water pipes.								
<b>ORZ001-004-011</b>	<b>Northern Coast - Northern Willamette Valley Including Portland Metro Area - Northern Cascades</b>								
	<b>23</b>	<b>2100PST</b>			<b>0</b>	<b>0</b>			<b>Heavy Snow</b>
	<b>24</b>	<b>1800PST</b>							
<b>ORZ001&gt;002</b>	<b>Northern Coast - Central Coast</b>								
	<b>24</b>	<b>0000PST</b>			<b>0</b>	<b>0</b>			<b>High Wind (G50)</b>
		<b>1800PST</b>							
<b>ORZ001</b>	<b>Northern Coast</b>								
	<b>24</b>	<b>0300PST</b>			<b>0</b>	<b>0</b>			<b>Ice Storm</b>
		<b>1000PST</b>							
	A Pacific storm on Christmas Eve produced sustained 44 mph winds with gusts to 57 mph at Newport, and sustained winds of 52 mph at Siuslaw, 44 mph at Sea Lion Caves, and 40 mph at Tillamook. The storm also dumped snow on much of Northwest Oregon. In the North Coast Range, Wilson River Highway Summit and Sunset Summit reported 4 inches of new snow, while in the Cascades Tombstone reported 12 inches of new snow, Timberline Lodge and Mt Hood Meadows 10 inches, and Santiam Pass 8 inches. The Northern Willamette valley reported amounts of 2 to 5 inches, which melted by early afternoon as temperatures warmed up. Astoria reported some freezing rain in the morning, which turned to rain as temperatures warmed mid morning.								

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b>OREGON, Northwest</b>									
<b>ORZ009</b>	<b>Western Columbia River Gorge</b>								
	25	1200PST			0	0			Ice Storm
	26	0600PST							
<b>ORZ001&gt;002</b>	<b>Northern Coast - Central Coast</b>								
	25	1400PST			0	0			High Wind (G63)
	26	0000PST							
<b>ORZ011</b>	<b>Northern Cascades</b>								
	25	1400PST			0	0			Heavy Snow
	26	1200PST							
A Christmas Day Pacific storm brought high winds to the coast, freezing rain to the Columbia River Gorge, heavy snow to the Cascades, and heavy rain to Northwest Oregon, which contributed to a major flood episode a few days later. Winds along the coast included Sea Lion Caves 61 gusting to 72 mph, Netarts 45 gusting to 70 mph, Newport 52 gusting to 67 mph, gusts to 69 mph at Seaside, Cannon Beach 50 gusting to 59 mph, and gusts to 63 mph at Tillamook, 60 mph at Yachats, and 59 mph at Astoria and Yaquina lighthouse. The last of the cold air from the arctic outbreak the previous week filtered through the Columbia River Gorge and caused freezing rain that created hazardous holiday driving conditions on Interstate 84. In the Cascades, Timberline Lodge reported 8 inches of new snow.									
<b>ORZ001-011</b>	<b>Northern Coast - Northern Cascades</b>								
	27	0800PST			0	0			Heavy Snow
	28	0800PST							
<b>ORZ001&gt;002</b>	<b>Northern Coast - Central Coast</b>								
	27	0800PST			0	0			High Wind (G67)
	28	0400PST							
The last powerful Pacific storm of a stormy month brought more high winds to the coast, heavy snow to the Cascades, and heavy rain to the Pacific Northwest. Wind reports at the coast included gusts to 77 mph at Seaside, 65 mph at Netarts, Yaquina and Siuslaw, winds 46 gusting to 65 mph at Newport, and winds 56 mph gusting to 62 mph at Sea Lion Caves. Snowfall totals in the Cascades included 15 inches at Santiam Pass, 12 inches at Century Drive near Mt Bachelor, and 10 inches at Timberline Lodge. rainfall totals for the two days ranged from 2 to 5 inches in the Willamette valley to 6 to 10 inches in the Coast Range.									
<b>ORZ001&gt;002-004&gt;006</b>	<b>Northern Coast - Central Coast - Northern Willamette Valley Including Portland Metro Area - Central Willamette Valley Including Salem - Southern Willamette Valley Including Eugene</b>								
	27	1200PST			0	0	2M		Flood
	30	1200PST							
A Pacific storm on December 27-28 dumped 2 to 5 inches of rain in lowlands and 6 to 10 inches of rain in the Coast Range. This deluge, on top of heavy rain December 25-26, combined with saturated soils and a rapidly melted heavy low elevation snowpack and frozen subsurface soils from the pre-Holiday arctic outbreak to create widespread lowland flooding. The Wilson River near Tillamook crested at 19.6 feet, which was higher than the previous record high flood of 19.51 feet in February 1996. The Tillamook area had 4 inches of rain December 27-28, and nearby mountains had the 6 to 10 inch totals, so the Tillamook area was the hardest hit. Fortunately, rain ended December 28, and rivers rapidly receded to below flood stage by the 30th. The rapid rise and fall of the Wilson river was almost like a flash flood. Many highways throughout Northwest Oregon were closed due to slides and washouts, especially along the coast and Coast Range. Highway 101 along the coast was closed for several days, and the Oregon Highway department estimated \$1.5 million damages to roads and highways. A slide destroyed a house near Alsea, and closed the highway to Corvallis. At least 30 other houses were destroyed. Fortunately, no deaths or serious injuries were reported during this episode. The Siletz river area and the community of Scio were also especially hard hit by flooding. Total damages will likely be in the \$2-4 million range.									
<b>OREGON, Southeast</b>									
<b>ORZ021</b>	<b>Lower Treasure Valley</b>								
	24	1500MST			0	0			Heavy Snow
	25	1900MST							
Starting on Christmas Eve and continuing through most of Christmas Day, a winter storm dumped 8 to 9 inches of snow in and around Ontario.									
<b>ORZ020</b>	<b>Baker</b>								
	24	1600PST			0	0			Heavy Snow
	25	1900PST							
A winter storm system dumped heavy snow on Baker County during Christmas Eve. Four to 6 inches of new snow fell in the Baker City area, with the town of Keating receiving 6 inches. Eight inches fell near the town of Halfway.									
<b>ORZ020</b>	<b>Baker</b>								
	25	1900PST			0	0			Heavy Snow
	26	0800PST							

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		

December 1998

## OREGON, Southeast

Baker County was hit again with heavy snow on the night of December 25th. An additional 3 to 4 inches fell near Baker City while Sumpter received 5 inches.

## OREGON, Southwest

### ORZ003

#### Southern Coast

01 0000PST

0

0

Flood

05 1815PST

Coquille River flooded. See narrative below

A flood warning was issued for the Coquille River from Coquille to Bandon on 11/30/98 at 1500 PST, and was extended upstream to Myrtle Point on 12/02. The warning for the Myrtle Pt. to Coquille portion was cancelled on 12/04 at 1230 PST and the warning for the remaining portion was cancelled at 1815 PST on 12/05/98.

The following river stage readings were reported:

	Date/Time	Reading	
Coquille R.@ Coquille	01/1100	22.80	
Flood Stage 21.0 feet.	01/1705	22.80	
	01/2245	22.75	
	02/0400	22.67	
	02/1545	22.79	
	03/0400	23.60	
	03/0840		23.65
	03/1450	23.44	
	03/2245	23.11	
	04/0245	22.96	
	04/0655	22.83	
	04/1230	22.61	
	05/1200	21.14	

N. Fork Coquille@Myrtle Pt.	03/0400	36.90
Flood Stage 35.0 feet	03/0840	36.19

### ORZ003-003-003-003

#### Southern Coast

01 1600PST

0

0

High Wind (G67)

1800PST

Cape Blanco observed winds 55g64kts

A Pacific storm brought strong south winds to the Oregon coast. A high wind warning was issued at 0332 PST on 12/01 and cancelled at 1000 PST on 12/02

### ORZ008

#### Rogue Basin

05 1940PST

0

0

Winter Storm

Spotter near Green Springs Summit reported 8 to 10 inches of snow today...still snowing lightly.

See previous event for narrative

### ORZ003

#### Southern Coast

12 1858PST

0

0

High Wind (G47)

Observed wind at Cape Blanco...47 mph gusting to 66 mph.

A High Wind Warning was issued for the Southern Oregon coast on 12/12 at 0250 PST and was later restricted to the headland areas. The warning was cancelled on 12/13 at 0611 PST.

### ORZ008

#### Rogue Basin

21 0800PST

0

0

Extreme Cold

Medford low on 12/21 and 12/22 was 6 degrees

An usually cold weather pattern developed over Southern Oregon beginning on 12/19. A Freeze warning was issued for Oregon zones 003, 007, 008 on 12/20 for forecast low temperatures more than 10 degrees below normal in zones 007, 008, and below freezing in 003. This warning verified in many places in every zone, but the Medford low is listed above as representative of the cold temperatures.

Numerous cold-related problems such as frozen pipes and heating system fires were reported in the media.

### ORZ003-003-003

#### Southern Coast

25 1458PST

0

0

High Wind (G49)

1612PST

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## OREGON, Southwest

Cape Blanco peak winds 49 KTS gusting to 62 KT.

A High wind watch was issued for the Oregon coast (zone 003) on 12/24 for the afternoon of 12/25. It is not known when the watch was upgraded to a warning, but the warning was cancelled on 12/25 at 2100 PST.

The warning verified numerous times at several locations. The strongest observed sustained wind speed and gust for each location is reported above.

### **ORZ003-003**

#### **Southern Coast**

27 2100PST  
2258PST

0 0

**High Wind (G46)**

Cape Arago winds 45 MPH gusting to 72 MPH.

Yet another Pacific storm moved in on 12/27, and a High Wind Warning was issued for the Southern Oregon coast (ORZ003) at 0910 PST. Verifying winds were reported at two locations. The peak winds at each location are listed above.

### **ORZ003**

#### **Southern Coast**

29 0215PST  
30 2200PST

0 0

**Flood**

See narrative below

Heavy rains caused the Coquille River to flood again...for the second time this month.

The warning was issued for the stretch from Myrtle Point to Bandon and included both the North and South forks of the river from Myrtle Point downstream to Bandon. The upper sections from Myrtle Point to Coquille were dropped by 1810 PST on 12/29. That section came within a foot of flood stage, but remained below it.

At Coquille, the river did reach flood stage (21.0 feet). The readings are listed below

	Date/Time	Stage
Coquille R. @Coquille 29/1745		21.5
	29/2145	21.7
	30/0545	21.8
	30/1045	21.5

## PACIFIC

NOT RECEIVED.

## PENNSYLVANIA, Central

PAZ004>006-  
010>012-017>019-  
024>028-033>037-  
041>042-045>046-  
049>053-056>059-  
063>066

**Warren - McKean - Potter - Elk - Cameron - Northern Clinton - Clearfield - Northern Centre - Southern Centre - Cambria - Blair - Huntingdon - Mifflin - Juniata - Somerset - Bedford - Fulton - Franklin - Tioga - Northern Lycoming - Sullivan - Southern Clinton - Southern Lycoming - Union - Snyder - Montour - Northumberland - Columbia - Perry - Dauphin - Schuylkill - Lebanon - Cumberland - Adams - York - Lancaster**

15 0001EST

0 0

**Drought**

Abnormally dry conditions through the Fall months developed into drought across all of central Pennsylvania by mid-December. Governor Tom Ridge declared drought emergency conditions in 9 central Pennsylvania counties with drought warnings in others, calling for restrictions on water use and reduced water consumption of 10 to 15 percent. Precipitation departures from normal for the 4 months leading up to the declaration totaled more than 8 inches in a number of locations, with nearly all areas in deficit by more than 4 inches. Bans were placed on outdoor burning as numerous woodland and brush fires occurred across the region.

### **PAZ004**

#### **Warren**

17 2200EST

0 0

**Heavy Snow**

Heavy lake effect snow squalls dropped 9 inches of snow in Grand Valley, and 6 inches in Garland. Three to five inches fell eastward, across eastern Warren and McKean Counties.

### **PAZ024-033**

#### **Cambria - Somerset**

30 1530EST

0 0

**Heavy Snow**

Heavy snow fell across the higher elevations of Somerset and Cambria Counties. Seven to ten inches were reported at Mt. Davis and Laurel Summit.

## PENNSYLVANIA, East

PAZ054>055-  
060>062-067>071

**Carbon - Monroe - Berks - Lehigh - Northampton - Chester - Montgomery - Bucks - Delaware - Philadelphia**

01 0000EST  
07 1800EST

0 0

0 0

**Unseasonably Warm**

A very strong and persistent ridge of high pressure at all levels of the atmosphere remained anchored across the western Atlantic Ocean and the Middle and South Atlantic States from November 28th through December 7th. The result was 10 consecutive days

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## PENNSYLVANIA, East

of record breaking, unseasonably warm weather across Eastern Pennsylvania. Many locations set new all-time monthly record high temperatures for December. The warmest days were December 4th and 7th. The highest temperatures included 77 degrees in West Chester (Chester County), at the Willow Grove NAS (Montgomery County) and the Northeast Philadelphia Airport, 76 degrees in Pottstown (Montgomery County) and Neshaminy Falls (Bucks County), 75 degrees in New Hope (Bucks County), 74 degrees in Chadds Ford (Delaware County), 73 degrees at the Philadelphia International Airport and 72 degrees at the Lehigh Valley International Airport.

The high temperatures of 73 degrees at the Philadelphia International Airport on both the 4th and the 7th not only set new daily high temperature records, but also established a new record for the month of December. The previous monthly record was 72 degrees and was set on December 29, 1984 and December 7, 1951. A new daily high temperature record also occurred on the 6th (69 degrees) at the Philadelphia International Airport. At the Lehigh Valley International Airport, the daily high temperature record was tied on the 2nd (63 degrees) and new daily record highs were set on the 3rd (66 degrees), 4th (72 degrees) and the 7th (71 degrees). The high temperature of 72 degrees on the 4th tied the all-time monthly record previously set on December 29, 1984. In a paradoxical scene for early December, people were buying Christmas trees with shorts on. A cold front moved through the region late in the day on the 7th and dropped temperatures closer to normal levels.

PAZ054>055-  
060>062-067>071

**Carbon - Monroe - Berks - Lehigh - Northampton - Chester - Montgomery - Bucks - Delaware - Philadelphia**

<b>03</b>	<b>0900EST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Drought</b>
<b>31</b>	<b>2359EST</b>				

The run of unseasonably dry weather that began in July started to take its toll on water supplies throughout the region. At the start of the month 84 percent of Pennsylvania's soils were rated as very short or short of moisture and 69 percent of all pasture lands were rated as being in poor or very poor condition. On December 2nd the dry weather forced the Pennsylvania State Department of Conservation and Natural Resources to ban all open fires in state forests because of the extremely dry conditions. The next day the Susquehanna River Basin Commission issued a drought advisory for the river's entire 27,510 square mile drainage area in New York, Pennsylvania and Maryland. The commission urged the public and water suppliers to voluntarily conserve water, particularly indoor uses. In conjunction, the Pennsylvania State Department of Environmental Protection issued a drought watch for all of Eastern Pennsylvania. The Pennsylvania State Department of Conservation and Natural Resources joined the state forests and game lands in imposing a ban on open fires and smoking. About 15 brush fires burned more than 25 acres in just the past few days across the state.

As December continued to be unseasonably dry, even drier than the previous months, reservoir levels continued to fall. On December 14th, the Delaware River Basin Commission declared a drought warning for the 7.3 million people within its 13,539 square mile basin in Pennsylvania, New Jersey, Delaware and New York. The Pennsylvania State Department of Environmental Protection upgraded Eastern Pennsylvania from a drought watch to a drought warning and called for a voluntary 10 to 15 percent reduction of non-essential water use. The Delaware River Basin Commission also asked people to voluntarily cut back on water usage by 15 percent. The Commission also cut back by 15 percent the amount of water New York City and New Jersey could remove from the upstream reservoirs and the river itself. On December 23rd, the Delaware River Basin Commission declared Stage Two of its drought warning. Water diversions by New York City and New Jersey were cut back an additional 15 percent in an effort to stretch existing supplies.

The drought's affects were not limited to upstream locations. In Bucks County, Upper Makefield Township issued a voluntary limited state of emergency for drought as wells in the village of Brownsburg were running dry. The Springton Reservoir, which supplies water to Delaware County was at 43 percent of capacity on December 23rd. Coatesville's (Chester County) reservoir was six feet below normal. The Saltwater line within the Delaware River was at River Mile 85, or about 3 miles upstream from Chester City (Delaware County). This was 11 miles farther upstream than normal for the middle of December and increase the corrosion control costs of industries. For the first time in its 46 year history, low water along the Delaware River prevented the reenactment of George Washington and his troops crossing the Delaware River. Instead they had to cross the Washington Crossing Bridge by foot on Christmas morning.

As dry as July through November were, December was even drier. On a county weighted average, every county in Eastern Pennsylvania had less than one inch of precipitation (.6 to .9). This was nearly 3 inches below normal and only 20 percent of the normal monthly December precipitation. The 0.62 inches of precipitation that fell in December at the Lehigh Valley International Airport was the second driest December on record. The 0.82 inches of monthly precipitation at the Philadelphia International Airport was the third driest December on record.

PAZ054>055-  
060>062-067>071

**Carbon - Monroe - Berks - Lehigh - Northampton - Chester - Montgomery - Bucks - Delaware - Philadelphia**

<b>22</b>	<b>0700EST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Wind</b>
	<b>1900EST</b>				

The large sea level pressure difference between a deepening low pressure system over the Canadian Maritimes and a large high pressure system over Kansas and Missouri produced peak wind gusts of around 40 mph in the Lehigh Valley and the Poconos and in the lower 40s in Southeast Pennsylvania. The highest recorded wind gusts were 45 mph at the Northeast Philadelphia Airport

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## PENNSYLVANIA, East

and 43 mph at the Philadelphia International Airport. Christmas trees and their stands were knocked over in Folsom (Delaware County).

### PAZ067>071

#### **Chester - Montgomery - Bucks - Delaware - Philadelphia**

<b>23</b>	<b>1800EST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Snow</b>
<b>24</b>	<b>0500EST</b>				

A series of weak low pressure systems moving northeast along a slow moving cold front over the western Atlantic Ocean brought southeast Pennsylvania its first snow of the season. It also was the first time since 1966 that more than one inch of snow fell on one of the two days before Christmas in the greater Philadelphia Metropolitan Area. The snow started around 6 p.m. EST on the 23rd. The heaviest snow occurred by around midnight with lighter snow lingering through the early morning of the 24th. Accumulations averaged between 1 and 3 inches and was heavier in some locations than the entire snowfall for the previous winter season.

This first snow of the season caused dozens of fender bender accidents. Interstate 95 in northeast Philadelphia had many skidding accidents. The Market Street Bridge over the Schuylkill River in Philadelphia was closed because of accidents and icy conditions. Snowfall accumulations included 2.5 inches in Clifton Heights (Delaware County), 2.0 inches at the Philadelphia International Airport, 1.5 inches in Wynnewood (Montgomery County) and Neshaminy Falls (Bucks County) and 1.0 inch in Exton and West Chester (Chester County).

### PAZ054>055

#### **Carbon - Monroe**

<b>29</b>	<b>0500EST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Wintry Mix</b>
	<b>2100EST</b>				

A weak low pressure system over the south Atlantic States the morning of the 29th moved northeast along the Atlantic seaboard and reached the Gulf of Maine the morning of the 30th. During the morning of the 29th, while temperatures were above freezing just above the surface, temperatures at ground level were below freezing. Freezing drizzle developed and made all untreated roads very hazardous. A 30 mile stretch of the Northeast Extension of the Pennsylvania Turnpike from Mahoning Township to Wilkes-Barre was closed from 945 a.m. EST through 1145 a.m. EST as road crews applied anti-skid material and removed thirteen accidents. The State Department of Transportation also closed one eastbound lane of Interstate 80 from Pennsylvania State Route 940 in Kidder Township east through Pennsylvania State Route 115 in Tobyhanna because of a stuck bus. Another bus traveling along Interstate 80 was involved in an accident in the Hickory Run area. No serious injuries were reported. Within Monroe County, there were over one hundred accidents reported. The Pennsylvania State Police in Swiftwater responded to 31 accidents by the middle of the afternoon on the 29th. Numerous minor accidents were also reported in Carbon County. During the afternoon of the 29th, as the low moved northeast along the Eastern Seaboard, precipitation became heavier and changed over from rain to snow across the Poconos. The change to snow took longest in the valleys, but by the time the precipitation ended during the evening of the 29th, it had snowed in all areas. Accumulations ranged from 1 to 5 inches and included 5 inches in Tobyhanna, 4 inches in Long Pond, 2.5 inches in East Stroudsburg and 1 inch in Lehigh.

### PAZ054-060-068

#### **Carbon - Berks - Montgomery**

<b>30</b>	<b>0700EST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Black Ice</b>
	<b>0900EST</b>				

Light rain and snow showers preceded and accompanied a strong cold front through southeast Pennsylvania the morning of the 30th. Accumulations were only a couple of tenths of an inch. Temperatures dropped sharply from above to below the freezing mark as the cold air came rushing in. This permitted the snow to initially melt, but then the water froze as temperatures fell and formed black ice. Numerous accidents were reported in Northern Chester and Montgomery Counties and Southeast Berks County, especially between 730 a.m. and 830 a.m. EST.

### PAZ054>055-060>062-067>071

#### **Carbon - Monroe - Berks - Lehigh - Northampton - Chester - Montgomery - Bucks - Delaware - Philadelphia**

<b>30</b>	<b>0700EST</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>Wind</b>
	<b>1800EST</b>				

For the second time in about a week, strong winds buffeted Eastern Pennsylvania. The difference in surface pressure between a deepening low pressure system over the Canadian Maritimes and a high pressure system over Illinois and Missouri produced peak wind gusts during the daylight hours of 40 to 45 mph in most areas. A 48-year-old man was seriously injured when the wind knocked over an oak tree onto his vehicle in Aldan Borough (Delaware County) at 10 a.m. EST. Later that afternoon the wind knocked down a second tree in Upper Darby Township in Delaware County. The highest wind gust at the Philadelphia International Airport was 43 mph.

### PAZ054>055-060>062-067>071

#### **Carbon - Monroe - Berks - Lehigh - Northampton - Chester - Montgomery - Bucks - Delaware - Philadelphia**

<b>31</b>	<b>2358EST</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Unseasonably Warm And Dry</b>
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December 1998 was another unseasonably dry month. On a county weighted average, every county in Eastern Pennsylvania had less than one inch of precipitation (.6 to .9). This was nearly 3 inches below normal and only 20 percent of the normal monthly December precipitation. The 0.62 inches of precipitation that fell in December at the Lehigh Valley International Airport was the second driest December on record. The 0.82 inches of monthly precipitation at the Philadelphia International Airport was the third driest December on record. December 1998 was also a much warmer than normal month and averaged around 6 degrees above

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## PENNSYLVANIA, East

normal. At the Lehigh Valley International Airport, the monthly mean temperature of 37.5 degrees was 5.7 degrees above normal and was the 5th warmest December on record. At the Philadelphia International Airport, the monthly mean temperature of 42.0 degrees was 6.2 degrees above normal and also was the 5th warmest December on record.

PAZ067>071

### **Chester - Montgomery - Bucks - Delaware - Philadelphia**

31 2359EST 0 0 0 Unseasonably Warm Year

The 1998 yearly mean temperature of 58.1 degrees at the Philadelphia International Airport tied 1931 and 1991 as the warmest year on record. Government temperature records have been kept in Philadelphia since 1874.

## PENNSYLVANIA, Northeast

PAZ038>040-

### **Bradford - Susquehanna - Wayne - Wyoming - Lackawanna - Luzerne - Pike**

043>044-047>048

01 0000EST 0 0 Drought  
31 2359EST

December was another very dry month across northeastern Pennsylvania. This culminated a six month period starting back in the early summer of dry conditions. During December, much of the region received between 1.0 and 1.5 inches of liquid equivalent precipitation. This equates to half or less of the normal precipitation for the month. Precipitation totals for the six month period between June and December averaged 6 to 7 inches below climatological normals for the entire region. A drought watch was issued early in the month by the Pennsylvania Department of Environmental Protection. This watch called for voluntary water conservation. The watch was upgraded to a drought warning on the 14th. The Delaware River Basin Commission followed suit with a drought warning issuance for those counties within the Delaware River Basin, including Wayne and Pike. These warnings remained in effect for the remainder of the month and called for a ten percent voluntary reduction in non-essential water usage.

## PENNSYLVANIA, Northwest

PAZ002>003

### **Southern Erie - Crawford**

16 1900EST 0 0 Heavy Snow  
18 0400EST

Lake effect snow accumulated an average of six to ten inches. Some higher amounts were recorded in Crawford County at Cambridge Springs (14"), Candohta Lake (26") and Meadville (16"); and in Erie County at Union City (22") and Franklin Center (13"). In Crawford County, trees were downed by the heavy snow.

PAZ002>003

### **Southern Erie - Crawford**

21 2300EST 0 0 Heavy Snow  
23 0500EST

Lake effect snow accumulated from four to eight inches in inland Erie County and ten inches was reported in Meadville in Crawford County.

PAZ001>003

### **Northern Erie - Southern Erie - Crawford**

30 0700EST 0 0 Heavy Snow  
31 2300EST

Lake effect snow accumulated 12 to 18 inches across Erie County and four to eight inches in northern Crawford County.

## PENNSYLVANIA, West

PAZ008>009

### **Venango - Forest**

17 0400EST 0 0 Heavy Snow  
18 0400EST

A cold front moving southeast across the Great Lakes brought the first significant snowfall of the year to northwest Pennsylvania. This front passed across northwest Pennsylvania during the late evening hours of the 16th, with any liquid precipitation turning quickly to snow by the early morning hours of the 17th. Although only a few inches of snow fell as the front passed across the area, several persistent lake effect snow bands set up across Forest and Venango counties and produced isolated snowfall totals of around 8 inches by the early morning hours of the 18th. Some snowfall totals included 8.1 inches at West Hickory in Forest County, 8.0 inches at Pleasantville in Venango County, 7.0 inches at Marienville in Forest County, and 4.0 inches at Franklin in Venango County.

## PUERTO RICO

San Juan

Countywide

03 0400AST 0 0 100K Flash Flood  
0800AST

Heavy rains in the overnight hours produced flash flooding in parts of Toa alta, Vega Baja, Manati, Caguas and Ciales. In Toa Alta several roads were completely flooded as Cibuco river overflowed its banks. Landslides were reported in some sectors of Toa Alta. In San Juan the Tortugo sector twelve homes were isolated by the rains.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## PUERTO RICO

### **Humacao**

**Luquillo**      **03**      **1305AST**                **2**      **1**           **Heavy Rain**

A rush of water in a stream in the Yunque Caribbean National Forest swept away three people killing two of them and injuring the other one. M23IW, M20IW

### **Guayama**

**Patillas**      **03**      **1900AST**                **0**      **0**           **Flash Flood**

An isolated thunderstorm with very heavy rains produced flash flooding in Patillas where La Mula river went out of its banks.

### **Humacao**

**Naguabo**      **27**      **0800AST**                **0**      **0**           **Urban/Sml Stream Fld**

An upper level trough in the vicinity of Puerto Rico produced very heavy rains and urban flooding in the vicinity of Naguabo. Road 31 was impassable due to flooding.

### **Humacao**

**Rio Grande**      **28**      **1700AST**                **0**      **0**      **10K**      **Flash Flood**

### **San Juan**

**Cayey**      **28**      **2000AST**                **0**      **0**      **50K**      **Flash Flood**

A nearly stationary upper level trough produced heavy rains across the eastern sections of Puerto Rico during the afternoon. Flooding was observed in Jimenes and La Ponderosa sectors in Rio Grande and in Beatriz sector in Cayey where several families had to be relocated.

### **Guayama**

**Patillas**      **31**      **1600AST**                **2**      **0**           **Rip Currents**

Two people drowned while swimming in Cortijo Beach in Patillas. M39IW, M17IW

## RHODE ISLAND

### **RIZ004**

#### **Eastern Kent**

**04**      **1400EST**                **0**      **0**           **Record Warmth**

A new record high temperature for the month of December of 71 degrees was established for Providence at T.F. Green Airport in West Warwick. The previous record was 67 degrees which was set in 1982. This followed a couple of days after the high temperature of 63 degrees on December 2 broke the record high of 62 degrees which was set in 1985.

### **RIZ004**

#### **Eastern Kent**

**07**      **1200EST**                **0**      **0**           **Record Warmth**

Unseasonably warm temperatures occurred throughout much of the state. High pressure over the western Atlantic generated an unusually warm westerly wind flow. A new record high temperature for the month of December of 77 degrees was established for Providence at T.F. Green Airport in West Warwick. The previous record was 71 degrees which was set just 3 days earlier on December 4. The high of 77 degrees also shattered the previous record high for the date, which was 63 degrees set in 1932.

### **RIZ002**

#### **Southeast Providence**

**22**      **0400EST**                **0**      **0**           **Strong Winds**

The passage of a strong cold front brought an end to unseasonably mild temperatures. Strong west to northwest winds of at least 35 to 45 mph were reported across the state. A peak gust to 46 mph was reported in the city of Providence. There were no reports of damage.

## SOUTH CAROLINA, Central

NONE REPORTED.

## SOUTH CAROLINA, North Coastal

### **SCZ017**

#### **Marlboro**

**25**      **0730EST**                **0**      **0**      **47K**      **Ice Storm**

Light rain froze on roads in the western part of the county, causing three car accidents. One accident occurred on US15, 9 miles west of Bennettsville, and the other two happened on SC9 in Wallace.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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December 1998

## **SOUTH CAROLINA, Northwest**

**SCZ001>009**      **Northern Oconee - Northern Pickens - Northern Greenville - Southern Oconee - Southern Pickens - Southern Greenville - Spartanburg - Cherokee - York**

<b>23</b>	<b>0900EST</b>	<b>0</b>	<b>0</b>	<b>Freezing Rain/Sleet</b>
<b>24</b>	<b>0500EST</b>			

Freezing rain and sleet developed early Wednesday morning and continued through the morning of Christmas Eve. Some areas later received enough glaze accretion to cause damage.

**SCZ007>009**      **Spartanburg - Cherokee - York**

<b>24</b>	<b>0500EST</b>	<b>0</b>	<b>0</b>	<b>Ice Storm</b>
	<b>1200EST</b>			

Freezing rain built a glaze to damaging levels by sunrise on Christmas Eve and many power outages continued to occur until late morning. Power was not restored to some places until the next morning.

**SCZ001>003**      **Northern Oconee - Northern Pickens - Northern Greenville**

<b>24</b>	<b>2200EST</b>	<b>0</b>	<b>0</b>	<b>Snow</b>
<b>25</b>	<b>0300EST</b>			

Finally, after the past two day's icy mixture the airmass became cold enough to support snow. Light snow accumulated between 1/2 and 2 inches late on Christmas Eve and early Christmas morning...just enough to declare the first white Christmas in many years.

## **SOUTH CAROLINA, South Coastal**

NONE REPORTED.

## **SOUTH DAKOTA, Central and North**

NONE REPORTED.

## **SOUTH DAKOTA, Southeast**

NONE REPORTED.

## **SOUTH DAKOTA, West**

NONE REPORTED.

## **TENNESSEE, Central**

### **Lawrence County**

<b>Countywide</b>	<b>12</b>	<b>1425CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
		<b>1730CST</b>			

Many roads were closed around the county due to high water.

### **Cumberland County**

<b>Countywide</b>	<b>12</b>	<b>2300CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
	<b>13</b>	<b>0330CST</b>			

Minor road flooding was reported by sheriff's department.

### **Fentress County**

<b>Countywide</b>	<b>12</b>	<b>2300CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
	<b>13</b>	<b>0330CST</b>			

Flooding of some rural roads around the county.

**TNZ006>011-022>023-025>029-032>033-033>034-056>062-062>066-075>080-094>097-097**      **Montgomery - Robertson - Sumner - Macon - Clay - Pickett - Benton - Houston - Dickson - Cheatham - Davidson - Wilson - Trousdale - Putnam - Overton - Fentress - Perry - Hickman - Lewis - Williamson - Maury - Marshall - Rutherford - Cannon - Dekalb - White - Cumberland - Bedford - Moore - Coffee - Warren - Grundy - Van Buren - Lawrence - Giles - Lincoln - Franklin**

<b>23</b>	<b>0730CST</b>	<b>0</b>	<b>11</b>	<b>1.5M</b>	<b>Winter Storm</b>
<b>24</b>	<b>2200CST</b>				

1/4 inch of ice on the ground at Clarksville.

Newspaper accounts reported treacherous driving conditions across Franklin county. 1/2 to 3/4 inch of ice was observed at 105 PM on December 24 and there was one injury. In Fentress county, 40 percent of the county was without power and numerous trees were down. 1/2 to 3/4 inch of ice reported as of 1200 PM over Pickett county. Trees were down and power outages along with 11/2 inch of ice reported at 1200 PM over DeKalb county. The Cookeville NOAA Weather Radio was knocked off the air, due to ice on power lines in Putnam county. In Overton county there was a car accident with 2 injuries near Alpine. 1/2 inch of ice at 1200 PM

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## TENNESSEE, Central

at Alpine and 1 inch of ice at Livingston in Overton county. 3 to 4 inches of sleet and ice with 2000 homes without power reported in Cannon county. There was a 1/2 inch of ice at 1110 AM CST in Murfreesboro with several fender benders. Also, 1/2 to 3/4 inch of ice on the ground by 1100 AM CST in Hartsville along with numerous car wrecks.

Widespread trees and power lines were down in Warren county. Warren and Coffee counties were the hardest hit counties in this winter storm. Caney Fork Electric estimated it cost 1.5 million dollars to restore downed utility poles and power lines. Most of the cost was for labor especially over the Christmas holiday. The damage was worst than the February Ice Storm of 1994 by three fold for Warren county. Cataclysmic tree and power line damage with one inch of ice in Coffee county. 80 percent of the residents were without power. Most of the damage was done when trees and power lines were coated with an inch of ice. The weight of the ice caused tree limbs and power lines to fall. This storm was considered worse than the February Ice Storm in 1994 for Coffee county.

The NWS office at Old Hickory had 0.7 inch of ice at 1100 AM CST. Nashville had 1/2 inch of ice from the storm. Centerville 1 inch and Ashland City received 1 to 2 inches of ice. Major tractor trailer pileup on I-40 eastbound at Mt. Eagle Mountain with 3 injuries in Overton county.

## TENNESSEE, East

TNZ012>018-  
035>047-067>074-  
081>087-098>102

**Scott - Campbell - Claiborne - Hancock - Hawkins - Sullivan - Johnson - Morgan - Anderson - Union - Grainger - Hamblen - Northwest Cocke - Cocke/Smoky Mountains - Northwest Greene - Southeast Greene - Washington - Unicoi - Northwest Carter - Southeast Carter - Roane - Loudon - Knox - Jefferson - Northwest Blount - Blount/Smoky Mountains - North Sevier - Sevier/Smoky Mountains - Sequatchie - Bledsoe - Rhea - Meigs - McMinn - Northwest Monroe - Southeast Monroe - Marion - Hamilton - Bradley - West Polk - East Polk**

22	0100EST	0	0	Ice Storm
24	1159EST			

The ice storm left minor accumulations of ice in valley locations due to warm ground temperatures. Most of the ice was on trees and bridges. Most roads were only wet. In higher elevations, the ice was much heavier. Around 5,000 customers lost power in McMinn and Meigs counties. In Hamilton county, nearly 10,000 people lost power, mainly on Lookout Mountain, Signal Mountain, Mowbray Mountain and Elder Mountain. In the Great Smoky Mountains National Park, the storm snapped limbs and uprooted thousands of trees, costing upwards of \$80,000 to clean up.

## TENNESSEE, West

TNZ048>054-  
089>092

**Lauderdale - Tipton - Haywood - Crockett - Madison - Chester - Henderson - Fayette - Hardeman - McNairy - Hardin**

23	0930CST	0	0	11K	Ice Storm
24	0500CST				

An ice storm moved into west Tennessee. Many counties in West Tennessee saw ice accumulation of between 1/4" and 1/2" with up to 2 inches of ice accumulation reported in Fayette county. A few trees were knocked down because of the ice. One person was killed in Fayette while driving on Interstate 40 which had ice on it.

## TEXAS, Central

TXZ049-053>054-  
064-127

**Fisher - Mitchell - Nolan - Sterling - Taylor**

11	1200CST	0	0	Heavy Snow
	1800CST			

A potent upper level storm system brought a dose of heavy snowfall to West Central Texas. The heaviest totals were across the western sections of the Big Country and the Northwest Concho Valley, where Colorado City recorded 7 inches of snowfall and both Sweetwater and Sterling City recorded 6 inch totals. A few of the heavier totals include:

Colorado City	7 inches
Sterling City	6 inches
Sweetwater	6 inches
Roby	4.5 inches
Trent	4 inches

The storm system also brought lighter snow accumulations to areas farther south and east, where totals in the 1 to 3 inch range were received from parts of Irion, Tom Green, Coke, Runnels, and Jones Counties.

**Brown - McCulloch - San Saba - Menard - Kimble - Mason**

23	1600CST	0	0	Ice Storm
24	0600CST			

TXZ140-154>155-  
168>170

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## TEXAS, Central

An arctic cold front combined with an upper level storm system to bring the second bout of winter weather this month to the area. A combination of freezing rain and sleet began during the afternoon of the 23rd and continued through the early morning hours of the 24th, making holiday travel nearly impossible across parts of West Central Texas. The Northwest Hill Country and the Heartland took the brunt of the storm, with ice accumulations up to one-half thick reported over much of McCulloch and Menard Counties, and between one-quarter and one-half thick across Brown, San Saba, Kimble, and Mason Counties. Although not quite as severe, areas farther north and west also saw some ice accumulations, with totals between a trace and a quarter-inch reported across sections of Coleman, Crockett, and Sutton Counties.

## TEXAS, Central Southeast

### **TXZ176>179**

#### **Madison - Walker - San Jacinto - Polk**

<b>22</b>	<b>1600CST</b>	<b>0</b>	<b>0</b>	<b>60K</b>	<b>Winter Storm</b>
<b>23</b>	<b>2030CST</b>				

Freezing drizzle/rain with a few reports of snow and sleet. Icing on area roads caused a significant number of automobile accidents.

### **TXZ195>198-211**

#### **Burleson - Brazos - Washington - Grimes - Austin**

<b>23</b>	<b>1614CST</b>	<b>0</b>	<b>0</b>	<b>75K</b>	<b>Winter Storm</b>
	<b>2059CST</b>				

Freezing rain/drizzle with a few reports of snow and sleet. Icy roads caused a significant amount of automobile accidents.

## TEXAS, Extreme West

NONE REPORTED.

## TEXAS, Mid - South

NONE REPORTED.

## TEXAS, North

### **Hunt County**

#### **Greenville**

<b>04</b>	<b>0006CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
	<b>0212CST</b>			

Streets and intersections were flooded, with some streets closed, at 0212 CST. Several motorists were stranded by high water.

### **Dallas County**

#### **Garland**

<b>04</b>	<b>0015CST</b>	<b>1</b>	<b>0</b>	<b>Flash Flood</b>
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A woman was swept away and drowned as she fled her stalled car, in Duck Creek, to move to higher ground. F?IW

### **Dallas County**

#### **Garland**

<b>04</b>	<b>0030CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
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A high water rescue had to be performed for two persons trapped in a creek.

### **Collin County**

#### **Central Portion**

<b>04</b>	<b>0100CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
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Highway 380 was closed due to high water.

### **Collin County**

#### **1 S Nevada**

<b>04</b>	<b>0100CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
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A car was submerged by high water on County Road 590 south of Nevada.

### **Rockwall County**

#### **Countywide**

<b>04</b>	<b>0130CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
	<b>0400CST</b>			

Numerous county roads were flooded.

### **Delta County**

#### **Cooper**

<b>04</b>	<b>0136CST</b>	<b>0</b>	<b>0</b>	<b>Flash Flood</b>
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City streets in Cooper, and in the western part of Delta County, were flooded.

### **Van Zandt County**

#### **2 N Phalba**

<b>04</b>	<b>0440CST</b>	<b>0</b>	<b>0</b>	<b>10K</b>	<b>Thunderstorm Wind</b>
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A mobile home was unroofed and an 18 wheeler was blown over by high thunderstorm winds.

### **Johnson County**

#### **Venus**

<b>04</b>	<b>0520CST</b>	<b>0</b>	<b>0</b>	<b>20K</b>	<b>Thunderstorm Wind</b>
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Strong thunderstorm winds damaged 3 mobile homes, 2 barns, and a recreational vehicle.

# Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	December 1998	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Persons Injured	Damage Property	Crops	Character of Storm
<b><u>TEXAS, North</u></b>									
<b>Van Zandt County</b>									
Countywide	04	0822CST			0	0			Flash Flood
Numerous county roads were flooded.									
<b>Kaufman County</b>									
Countywide	04	0845CST			0	0			Flash Flood
Numerous county roads were flooded.									
<b>Hunt County</b>									
6 S Greenville	04	1330CST 1350CST			0	0	15K		Flash Flood
Motorists were stranded by high water on Highway 34. A car and two pickup trucks were swept off Farm Market 1903 near Interstate 30.									
<b>Wise County</b>									
Newark	06	1040CST			0	0			Thunderstorm Wind (G50)
<b>Denton County</b>									
Krum	06	1100CST			0	0			Thunderstorm Wind (G59)
<b>Wise County</b>									
1 E Decatur	07	1120CST			0	0			Thunderstorm Wind (G52)
<b>Ellis County</b>									
Red Oak	07	1520CST			0	0			Flash Flood
Numerous streets were flooded.									
<b>Ellis County</b>									
Waxahachie	07	1520CST			0	0			Flash Flood
Numerous streets were flooded.									
<b>Ellis County</b>									
Countywide	07	1531CST			0	0			Flash Flood
Parts of Interstate 35 were flooded.									
<b>Ellis County</b>									
Countywide	10	1306CST 2125CST			0	0			Flash Flood
Five county roads were closed between Maypearl and Midlothian.									
<b>Hill County</b>									
2 SW Covington to 2 S Covington	10	1306CST 2130CST			0	0			Flash Flood
Thunderstorm rains caused county roads to be closed due to high water.									
<b>Johnson County</b>									
Countywide	10	1510CST			0	0			Flash Flood
Four county roads were closed due to high water from thunderstorm rains.									
<b>Ellis County</b>									
Countywide	10	1730CST			0	0			Flash Flood
Additional county roads were flooded and closed from thunderstorm rains.									
<b>Hunt County</b>									
Quinlan	10 11	1914CST 0230CST			0	0			Flash Flood
Numerous county roads were closed, west of Quinlan, due to heavy rains.									
<b>Johnson County</b>									
Mansfield	10	2128CST			0	0			Flash Flood
Several county roads near Mansfield were closed due to high water from thunderstorm rains.									

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property		

December 1998

## TEXAS, North

**TXZ091>095-  
098>107-115>123-  
129>135-141>148-  
156>162-174>175**

**Montague - Cooke - Grayson - Fannin - Lamar - Haskell - Throckmorton - Young - Jack - Wise - Denton - Collin - Hunt - Delta - Hopkins - Stephens - Palo Pinto - Parker - Tarrant - Dallas - Rockwall - Kaufman - Van Zandt - Rains - Eastland - Erath - Hood - Somervell - Johnson - Ellis - Henderson - Comanche - Mills - Hamilton - Bosque - Hill - Navarro - Freestone - Anderson - Lampasas - Coryell - Bell - McLennan - Falls - Limestone - Leon - Milam - Robertson**

**22 0000CST  
24 2359CST**

**6 0**

**Ice Storm**

A strong arctic cold front moved through North Texas on the 21st, bringing freezing temperatures to all of North Texas by the morning of the 22nd. Southwest winds aloft produced overrunning conditions, resulting in cloudy skies and a mixture of freezing rain, sleet, and snow. The precipitation began in the western part of North Texas and spread eastward covering the entire area by the 23rd.

At various times, all North Texas counties had icy streets, bridges, overpasses, and highways. The ice caused at least 2,000 accidents, mainly in the Dallas/Fort Worth metropolitan area, killing six persons, closing many highways, and cancelling over 400 flights at the Dallas/Fort Worth International Airport. Two homeless persons died of hypothermia, and dozens of people were injured from falling on the ice.

December 22nd - A homeless male, age 56, died of hypothermia in Dallas.

December 22nd - A vehicle ran off the ice covered road and sideswiped a tree, killing the driver, north of Sunset in Montague County. The driver was a male, age 44.

December 23rd - A homeless male, age unknown, died of hypothermia in Ft. Worth.

December 23rd - A car slid into a male pedestrian, age 55, killing the pedestrian in Irving.

December 23rd - A car slid into a signpost, killing the male driver, age 33, in Duncanville.

December 23rd - An 18 wheeler slid into a car, killing the car's driver, in Grandview (Johnson Co.). The age of the male is unknown.

M56OU, M?OU, M55OU, M33OU, M?VE, M44VE

## TEXAS, North Panhandle

NONE REPORTED.

## TEXAS, Northeast

**TXZ096>097-  
108>112-124>126-  
136>138-149>153-  
165>167**

**Red River - Bowie - Franklin - Titus - Camp - Morris - Cass - Wood - Upshur - Marion - Smith - Gregg - Harrison - Cherokee - Rusk - Panola - Nacogdoches - Shelby - Angelina - San Augustine - Sabine**

**22 1800CST  
24 2000CST**

**0 0**

**Ice Storm**

A shallow arctic air mass spread across northeast and east Texas while low pressure formed in the Gulf of Mexico. This allowed overrunning of warm moist air over the cold dome producing widespread freezing rain and sleet. Overall ice accumulations were less than one inch. The ice accumulated mainly across exposed surfaces such as trees and powerlines as well as bridges and overpasses. A few automobile accidents and downed trees and powerlines were the worst result of the storm.

## TEXAS, South

NONE REPORTED.

## TEXAS, South Central

### **Lee County**

**Countywide**

**11 1100CST  
1330CST**

**0 0**

**5K**

**Flash Flood**

Heavy rainfall in northeastern Lee County produced general 3-4 inch totals in 2 hours that caused flash flooding along Yegua Creek along the Lee-Burleson County line for nearly three hours.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## TEXAS, South Central

**TXZ171>173-186-188>193-205>206 Llano - Burnet - Williamson - Kerr - Gillespie - Kendall - Blanco - Hays - Travis - Bastrop - Bexar - Comal**

**23 0200CST 0 0 Winter Storm**  
**24 1600CST**

Temperatures in the 70s on the afternoon of December 21st plunged into the 20s by evening as an arctic cold front crossed through South Central Texas on its way to the Gulf of Mexico. North winds gusting to 30 and 35 mph brought chill indices near the zero-mark. Cold and cloudy weather persisted through December 22nd and 23rd, with daytime temperatures holding in the 20s over the Texas Hill Country and in the low 30s to near 30 for the remainder of South Central Texas. Spotty freezing rain and freezing drizzle on the morning of the 23rd began to cover roads and bridge, making driving very difficult. As ice continued to accumulate, driving became very dangerous for the northern half of South Central Texas.

By the morning of Thursday, December 24th, only spotty and very light amounts of freezing rain were reported, with essentially no additional accumulation occurring. By midday, temperatures were moving slowly above the freezing mark and by mid-afternoon the winter threat had ended.

Over 400 vehicle accidents were reported in the Austin area, with nearly 200 in the San Antonio area. Vehicular accidents accounted for dozens to hundreds of injuries, as well as 3 deaths in Travis County, one in Guadalupe County and two in Bexar County. Several other injuries were reported as pedestrians slipped on icy pathways.

## TEXAS, South Panhandle

**TXZ021>044 Parmer - Castro - Swisher - Briscoe - Hall - Childress - Bailey - Lamb - Hale - Floyd - Motley - Cottle - Cochran - Hockley - Lubbock - Crosby - Dickens - King - Yoakum - Terry - Lynn - Garza - Kent - Stonewall**

**01 0000CST 0 0 450M Drought**  
**31 2359CST**

Near-average precipitation returned to the South Plains area in December. However, the effects of this year's drought became better understood after year-end agricultural reports were completed. These reports, compiled by the Texas Agricultural Extension Service at Texas A&M University, indicated that total crop damage may have been about \$450 million due to the drought across the Texas South Plains area in 1998. This figure is based on the total cash value of all crops in 1998, compared to the average of the same figure from 1996 and 1997.

Cotton is the dominant crop in this region, and not surprisingly, accounted for roughly 75% (\$330 million) of the losses this year. Significant losses were also suffered in the corn (\$58 million), wheat (\$35 million), sorghum (\$18 million), and soybean (\$18 million) crops.

## TEXAS, Southeast

NONE REPORTED.

## TEXAS, West

**TXZ050>052-058>063-067>068-074-079 Andrews - Martin - Howard - Reeves County And Upper Trans Pecos - Loving - Winkler - Ector - Midland - Glasscock - Ward - Crane - Davis Mountains - Presidio Valley**

**11 0200CST 0 0 Heavy Snow**  
**1600CST**

A strong upper level storm system interacted with copious amounts of Gulf and Pacific moisture to produce a heavy snow event across portions of Southeast New Mexico and West Texas. This storm system moved from west to east across the area with snowfall amounts up to 12 inches in western Reeves County. This turned out to be the snow storm of the century for the Midland/Odessa area as the 9.75 inches recorded at the Midland International Airport set new records for the greatest daily snowfall, the greatest single event snowfall, and the greatest monthly snowfall ever recorded. Most of this snow fell in an intense 4-5 hour period. Numerous traffic accidents were reported on icy roads with a large number of injuries and one fatality. The heavy snowfall also resulted in loss of power for some communities.

## TEXAS, Western North

**TXZ083>090 Hardeman - Foard - Wilbarger - Wichita - Knox - Baylor - Archer - Clay**

**21 0400CST 0 0 Ice Storm**  
**2200CST**

A prolonged period of light freezing drizzle affected western portions of North Texas on the 21st, producing a thin layer of ice on most roads. Dozens of traffic accidents were reported across the area along with 2 fatal traffic accidents, both of which occurred in Archer County. Precipitation amounts were very light with Shepard Air Force Base in Wichita Falls (Wichita County) recording just one hundredth of an inch on the 21st.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property		

December 1998

## TEXAS, Western North

**TXZ083>090**

**Hardeman - Foard - Wilbarger - Wichita - Knox - Baylor - Archer - Clay**

**23 0600CST**  
**24 0300CST**

**0 0**

**Ice Storm**

An extended period of light freezing drizzle or light freezing rain mixed with light snow and light sleet fell across western portions of North Texas on the 23rd and early on the 24th, producing a thin glaze of ice on most area roads. Dozens of traffic accidents occurred including 59 in Wichita County on the 23rd. There was also a 10 car pile-up in Bellvue in Clay County. Slick roads were also reported in Wilbarger, Foard, and Hardeman Counties, but accidents were less numerous than in Wichita and Clay Counties. Shepard Air Force Base in Wichita Falls (Wichita County) recorded just a trace of precipitation during the event.

## UTAH, North, Central and South

**UTZ001>004-006>008**

**Cache Valley/Utah Portion - Northern Wasatch Front/Brigham City/Ogden Bountiful - Salt Lake And Toole Valleys - Southern Wasatch Front/Lehi/Provo/Nephi - Wasatch Mountain Valleys/Huntsville/Park City/Heber - Wasatch Mountains I80 North - Wasatch Mountains South Of I80**

**04 0600MST**  
**2300MST**

**0 0**

**50K**

**Winter Storm**

A slow moving but vigorous cold front moved down the Wasatch Front early on the 4th, dumping 2-4 inches in the valleys, 4-8 inches along the benches and over a foot in the mountains. Thunderstorms accompanied the front...producing widespread power outages in southeast portions of the Salt Lake Valley. Several traffic accidents and a jack-knifed truck closed Parley's Canyon for a short time. No serious injuries were reported. Some of the snowfall amounts included 16 inches at The Canyons, 15 inches at Snowbird, 14 inches at Alta and the Bountiful bench and 12 inches at Monte Cristo and Snowbasin.

**UTZ003-014>017-020**

**Salt Lake And Toole Valleys - Sanpete/Sevier Valleys - West Central Utah/Delta - Southwest Utah/Cedar City/Milford - Central And Southwest Mountains - South Central Utah/Kanab/Escalante**

**06 0900MST**  
**1900MST**

**0 0**

**Heavy Snow**

A system moving through Northern Arizona produced areas of heavy snow across Southern Utah on the 6th. Also, weak system had enough moisture and cold air to produce the "dreaded lake effect" snow event over the Tooele Valley. The city of Tooele received from 11-14 inches as the cold, moist, unstable air moved across the relatively warm Great Salt Lake. Also, Stockton received a foot of snow, erda 11 inches, Stansbury Park 10 inches, and Brian Head had 8 inches.

**UTZ007>008-016**

**Wasatch Mountains I80 North - Wasatch Mountains South Of I80 - Southwest Utah/Cedar City/Milford**

**08 1000MST**  
**2000MST**

**0 0**

**Heavy Snow**

Another small storm left good amounts of snow in some mountain locations. Alta, Snowbird and Brian Head received 10 inches, with 8 inches at Kanosh, 7 inches at Sundance and Brighton, and 6 inches at Solitude and Aspen Grove. Cedar City reported 4-6 inches.

**UTZ019**

**Utah'S Dixie And Zion National Park**

**09 2245MST**

**0 0**

**0**

**0**

**High Wind**

Gusty north winds blew in favored areas of Washington County during the evening hours. A weather spotter in Pintura estimated winds gusting to 60 mph (52 kts). No damage was reported.

**UTZ019**

**Utah'S Dixie And Zion National Park**

**16 0300MST**  
**1100MST**

**0 0**

**0.50K**

**0**

**High Wind**

Strong high pressure over the Great Basin produced strong northerly winds once again over Washington County. Pintura again seemed to be the windiest area, with a weather spotter reporting a wind gust to 70 mph, which blew out a window in his home.

**UTZ001-001>002-002>003-003>004-004>006-006>007-007>018-020>027**

**Cache Valley/Utah Portion - Northern Wasatch Front/Brigham City/Ogden Bountiful - Salt Lake And Toole Valleys - Southern Wasatch Front/Lehi/Provo/Nephi - Great Salt Lake Desert And Mountains/Wendover/Snowville - Wasatch Mountain Valleys/Huntsville/Park City/Heber - Wasatch Mountains I80 North - Wasatch Mountains South Of I80 - Western Uinta Mountains - Wasatch Plateau/Book Cliffs - Western Uinta Basin - Castle Country/Price/Castle/Dale/Emery - San Rafael Swell/Greene River/Hanksville - Sanpete/Sevier Valleys - West Central Utah/Delta - Southwest Utah/Cedar City/Milford - Central And Southwest Mountains - Southeast Mountains/Canyonlands - South Central Utah/Kanab/Escalante - Glen Canyon Recreation Area/Lake Powell - Southeast Utah/Blanding - Eastern Uinta Mountains - Eastern Uinta Basin - Tavaputs Plateau - Grand Flat - Arches/North La Sals**

**19 1800MST**  
**21 1800MST**

**0 10**

**100K**

**Winter Storm**

The leading edge of an arctic airmass brought heavy snow to much of Northern Utah late on the 19th into the 20th, with the heavy snow pushing into Southern Utah on the 21st. For awhile on the 20th, I-70 from Salina to Green River was closed due to heavy

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## UTAH, North, Central and South

snow. Power outages were also noted in portions of South Jordan. Numerous traffic accidents with minor injuries were blamed on the slippery road conditions. The most serious accident occurred when a Utah Highway Patrol trooper was hit by a pickup truck on Interstate 80 while placing flares and cones around an accident scene. The trooper suffered a broken leg and wrist. Some of the heavier snowfall amounts over the period were 28-30 inches at Fremont Indian State Park, 29 inches at Elk Meadows, 23 inches in Kanosh, 22 inches in Duck Creek, 20 inches at Brian Head and 18 inches at Milford. Most valley locations received from 2-6 inches, with 6-12 inches common over many mountain locations.

UTZ001>027

**Cache Valley/Utah Portion - Northern Wasatch Front/Brigham City/Ogden Bountiful - Salt Lake And Toole Valleys - Southern Wasatch Front/Lehi/Provo/Nephi - Great Salt Lake Desert And Mountains/Wendover/Snowville - Wasatch Mountain Valleys/Huntsville/Park City/Heber - Wasatch Mountains I80 North - Wasatch Mountains South Of I80 - Western Uinta Mountains - Wasatch Plateau/Book Cliffs - Western Uinta Basin - Castle Country/Price/Castle/Dale/Emery - San Rafael Swell/Greene River/Hanksville - Sanpete/Sevier Valleys - West Central Utah/Delta - Southwest Utah/Cedar City/Milford - Central And Southwest Mountains - Southeast Mountains/Canyonlands - Utah'S Dixie And Zion National Park - South Central Utah/Kanab/Escalante - Glen Canyon Recreation Area/Lake Powell - Southeast Utah/Blanding - Eastern Uinta Mountains - Eastern Uinta Basin - Tavaputs Plateau - Grand Flat - Arches/North La Sals**

21 0600MST 0 0 20K Extreme Cold  
24 0600MST

Bitterly cold arctic air swept over the state, bringing sub-zero readings to most areas. The extreme cold caused quite a few problems with frozen pipes. The coldest readings recorded during the arctic blast were -40 at Greenville, -34 at Roosevelt, -30 in Milford, -29 at Woodruff, -27 at Manti, -26 at Randolph, -25 in Joseph and Delta, -24 in Richfield and -23 at Duchesne.

UTZ007>008

**Wasatch Mountains I80 North - Wasatch Mountains South Of I80**

26 0600MST 0 0 0 0 Heavy Snow  
29 2000MST

A moist northwesterly flow brought periods of snow to the northern mountains of the state. Some heavier amounts included Monte Cristo and Park City with 17 inches, Solitude with 14 inches, Brighton 13 inches, Beaver Mountain 12 inches, and Deer Valley 11 inches.

UTZ009>011

**Western Uinta Mountains - Wasatch Plateau/Book Cliffs - Western Uinta Basin**

26 1000MST 0 0 2K 0 Flood  
28 1700MST

The sudden arctic blast caused a rapid freeze on portions of the Strawberry River near Duchesne. The rapid freeze caused the water to surge over the top of the ice, creating huge slush flows. This caused a backup and the river flowed out of its banks, threatening a home. The river flowed through their yard, getting within 1 or 2 inches of the house. That was when 100 neighbors came to their rescue, bringing a backhoe, a tractor and plenty of sandbags. The house was saved, and the river diverted.

UTZ002>004-  
006>008-014-016

**Northern Wasatch Front/Brigham City/Ogden Bountiful - Salt Lake And Toole Valleys - Southern Wasatch Front/Lehi/Provo/Nephi - Wasatch Mountain Valleys/Huntsville/Park City/Heber - Wasatch Mountains I80 North - Wasatch Mountains South Of I80 - Sanpete/Sevier Valleys - Southwest Utah/Cedar City/Milford**

31 1200MST 0 0 Winter Storm  
2359MST

The year ended on a snowy note over many mountain locations of the state, as another storm pushed through. The storm lingered into the early morning hours of the new year, but most of the snow fell before the clock struck midnight. Some of the higher snow totals were Elk Meadows with 20 inches, Alta with 12 inches, Snowbird 10 inches, and Farmington Canyon with 7 inches.

## UTAH, Northeast

NONE REPORTED.

## VERMONT, North and Central

VTZ008

**Washington**

01 0000EST 0 0 Unusual Warmth  
2359EST

During the early morning hours, the temperature at Knapp State Airport (Montpelier-Barre Airport - MPV) reached 61 degrees setting a new record high temperature. The previous record being 59 degrees, set in 1991.

VTZ005

**Chittenden**

07 0000EST 0 0 Unusual Warmth  
2359EST

During the early morning hours, the temperature at the Burlington International Airport (BTV) reached 67 degrees setting a new

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	December 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## VERMONT, North and Central

record high temperature. The previous record being 61 degrees, set in 1932. In addition, this also tied the all time record high temperature for the month of December, previously set on December 5th, 1941.

### VTZ007

#### Caledonia

07 0000EST  
2359EST

0 0

Unusual Warmth

During the morning hours, the temperature in St. Johnsbury reached 67 degrees setting a new record high temperature. The previous record being 60 degrees, set in 1932. In addition, this also set an all time record high temperature for the month of December, previously the record monthly high temperature was 65 degrees set on December 8th, 1895.

### VTZ008

#### Washington

07 0000EST  
2359EST

0 0

Unusual Warmth

During the morning hours, the temperature at Knapp State Airport (Montpelier-Barre Airport - MPV) reached 67 degrees setting a new record high temperature. The previous record being 61 degrees set in 1951. In addition, this also set an all time record high temperature for the month of December, previously the record monthly high temperature was 64 degrees set on December 4th, 1982.

### VTZ003>009

#### Orleans - Essex - Chittenden - Lamoille - Caledonia - Washington - Addison

17 0000EST  
1800EST

0 0

70K

Light Snow

An area of low pressure moved across eastern New England during Thursday, December 17th, 1998 and then into the Canadian maritimes early Friday, December 18th. Light snow fell across the area with the heaviest accumulations in and east of the Green Mountains. A number of minor automobile accidents were reported. General snow accumulations in these areas were 4 to 5 1/2 inches. A few specific reports follow:

Newport (Orleans county).....5.5 inches  
Hanksville (Chittenden county).....5.3 inches  
Brookfield (Orange county).....5.0 inches  
South Lincoln (Addison county).....4.9 inches  
Sutton (Caledonia county).....4.4 inches

### VTZ005

#### Chittenden

22 0100EST  
0500EST

0 0

100K

High Wind

An area of low pressure moved northeast through eastern Canada Monday night (December 21st) and Tuesday (December 22nd). Much colder air moved in on strong winds that accompanied and followed the associated cold front. A number of tree limbs were blown down in Chittenden county and a large tree was blown down onto a house in South Burlington, VT (Chittenden county) with extensive roof and structure damage.

### VTZ001>012

#### Grand Isle - Franklin - Orleans - Essex - Chittenden - Lamoille - Caledonia - Washington - Addison - Orange - Rutland - Windsor

30 0000EST  
31 2359EST

0 0

Extreme Cold

Low pressure moved into the Canadian maritimes Wednesday (December 30th) and the associated arctic front moved across the area early Wednesday (December 30th). Very cold air was ushered in on strong winds. Snow squalls occurred across the area with between 3 and 5 inches falling in the mountains. Mount Mansfield reported 5 inches. In Rutland county several mountain roads were blocked for a short period of time Wednesday (December 30th).

## VERMONT, South

### VTZ013>014

#### Bennington - Windham

02 1800EST  
07 1800EST

0 0

Record Warmth

The beginning of December was a period of record warmth across Southern Vermont. An area of high pressure off the Mid-Atlantic coast, produced a persistent south to southwesterly flow. From December 2 through December 7, temperatures averaged 10 to 15 degrees above normal.

## VIRGIN ISLANDS

### St. Croix County

#### St. Croix

04 1700AST  
1900AST

0 0

Urban/Sml Stream Fld

Heavy rains produce street flooding across most of the island.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## VIRGIN ISLANDS

### **St. Croix County**

**St. Croix**      **05**      **0700AST**           **0**      **0**           **Urban/Sml Stream Fld**  
**0900AST**

St. Croix police reported several roads and streets flooded by the rains.

## VIRGINIA, East

**VAZ048>049-  
060>094-096-099>100**

**Fluvanna - Louisa - Prince Edward - Cumberland - Goochland - Hanover - Caroline - Mecklenburg - Lunenburg - Nottoway - Amelia - Powhatan - Chesterfield - Henrico - King William - King And Queen - Essex - Westmoreland - Richmond - Northumberland - Lancaster - Brunswick - Dinwiddie - Prince George - Charles City - New Kent - Gloucester - Middlesex - Mathews - Greensville - Sussex - Surry - James City - York - Southampton - Isle Of Wight - Newport News - Suffolk - Accomack - Northampton**

**23**      **1400EST**           **0**      **0**      **20M**      **Ice Storm**  
**25**      **0500EST**

A major ice storm affected central and eastern Virginia from Wednesday, December 23rd into Friday, December 25th. A prolonged period of freezing rain and some sleet resulted in ice accumulations of one half inch /0.50/ to one inch /1.00/ in many locations. The heavy ice accumulations on trees and power lines caused widespread power outages across the region. Approximately 400,000 customers were without power during the maximum outage period, Christmas Eve day. Some customers were without power for about ten days. Many accidents occurred due to slippery road conditions, especially bridges and overpasses. Many secondary roads were impassable due to fallen tree limbs and in a few cases, whole trees.

## VIRGINIA, Extreme Southwest

**VAZ001>002-  
005>006-008**

**Lee - Wise - Scott - Russell - Washington**

**22**      **0100EST**           **0**      **0**           **Ice Storm**  
**24**      **1159EST**

Only light accumulations of ice were reported, mainly in higher mountain elevations. In the valleys, mainly rain was reported, with only a few slick spots on bridges.

## VIRGINIA, North

**VAZ025>031-  
036>042-050>057**

**Augusta - Rockingham - Shenandoah - Frederick - Page - Warren - Clarke - Nelson - Albemarle - Greene - Madison - Rappahannock - Fauquier - Loudoun - Orange - Culpeper - Prince William - Fairfax - Arlington - Stafford - Spotsylvania - King George**

**01**      **0000EST**           **0**      **0**           **Drought**  
**31**      **2359EST**

This was the sixth month in a row that drought conditions were seen across Northern Virginia. Persistent high pressure over the Southeast U.S. forced most precipitation producing low pressure systems to steer north of the region. In addition, record high temperatures baked the region during the first week of the month. Only 1.74 inches of precipitation fell at Washington Reagan National Airport in Arlington County during December, 1.38 inches below normal. In the past 127 years, only one other July through December on record (1930) received less precipitation than the last half of 1998. The 6 month total at the airport was only 7.45 inches, 12.82 inches below normal. Similarly, 1.53 inches of precipitation fell at Dulles Airport in Loudoun County during December, 1.69 inches below normal. The 6 month precipitation total at Dulles Airport was only 7.27 inches, 13.24 inches below normal. Other monthly precipitation totals from area counties included 0.8 inches in Frederick, 1.2 inches in Clarke, 1.4 inches in Orange, Warren and Loudoun, 1.5 inches in Shenandoah, 1.6 inches in Fauquier and the city of Fredericksburg, 1.7 inches in Culpeper, 1.9 inches in Rockingham, 2.0 inches in Rappahannock and Fairfax, 2.2 inches in Augusta, and 3.1 inches in Madison.

The Ni Reservoir, main water supply in Spotsylvania County, remained at a record low level through the month. Mandatory water restrictions continued across the county for the fifth straight month, and on the 8th, county businesses were banned from using water outdoors. Many community wells ran dry in rural Spotsylvania County, Rappahannock County and near Hopkins in Orange County. Many other communities across Northern Virginia instituted voluntary water restrictions during the month, including Loudoun and Fairfax Counties. Goose Creek Reservoir in Loudoun County was partially drained into Beaverdam Creek Reservoir to keep the main water storage site for Loudoun and Fairfax Counties full. The Hirst Reservoir near Purcellville in Loudoun County dropped 6 feet below normal by mid month, and Lake Manassas was 8 feet below normal during December. The Thorton River near Sperryville in Rappahannock County ran dry, and stream flow on all rivers within the Potomac, Shenandoah, and Rappahannock river basins were 85% below normal during December. The Palmer Index rated Northern Virginia in a severe to extreme drought, and the Governor declared a state of emergency across Virginia on December 1st due to the dry weather and resulting extreme fire danger. An open burning ban continued across Virginia through December 10th.

**Frederick - Page - Warren - Clarke - Albemarle - Greene - Madison - Rappahannock - Fauquier - Loudoun - Orange - Culpeper - Prince William - Fairfax - Arlington - Stafford - Spotsylvania**

**23**      **1200EST**           **0**      **0**           **Winter Weather**  
**24**      **0400EST**

A cold front swept across Virginia on the 22nd of December, ushering in sub-freezing air that set the stage for a mixed bag of

**VAZ028>031-  
037>042-050>056**

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## VIRGINIA, North

precipitation the following day. On the 23rd, a weak upper level disturbance from the Gulf States moved quickly across the Mid Atlantic region, dropping between a trace and 2 inches of snow across Northern Virginia, in addition to a thin layer of ice and sleet. The combination of mixed precipitation, holiday travellers, and the first snowstorm of the season for drivers led to many traffic accidents. Law enforcement officials reported 70 accidents during the evening rush hour on the 23rd around Washington D.C. In Fairfax County, a tanker truck slid into a ditch in Centreville, leading to a hazardous materials spill and an 11 hour road closure. Interstate 81 was also treacherous, especially between Stephens City and Winchester in Frederick County. A tractor trailer tipped over on the I-81 ramp to U.S. Route 50, closing it from 3 to 11 PM, and two people were injured in a crash at the I-81 Millwood Pike bridge. The westbound lanes of Interstate 64 had to be shut down for two hours in Albemarle County after a tractor trailer wrecked east of Afton and over 50 other accidents lined the highway. A 25 car pileup was reported on U.S. 29 just south of Greene/Albemarle County line. State Route 3 and 208 had to be closed for a short time due to multiple accidents. A 74 year old man was killed in a car accident on the 23rd at 5:45 PM on State Route 208 in Spotsylvania County after his vehicle hit ice and flipped over.

Snowfall totals included 0.4 inches at Washington Reagan National Airport (Arlington County), 0.5 inches in Augusta, Rockingham, and Rappahannock Counties, 0.6 inches at Dulles International Airport (Eastern Loudoun County), 0.7 inches in Orange County, 1.0 inches in Frederick, Clarke, Madison and Albemarle County, 1.3 inches in Western Loudoun County, and 1.7 inches in Fauquier County. In addition, many locations received a coating of freezing rain and sleet. This thin layer of ice knocked out power for up to 12 hours for 100 customers in Albemarle County early on the 24th. The wintry mix remained on the ground through December 25th, giving the region a rare "white Christmas".

## VIRGINIA, Northwest

VAZ003>004

**Dickenson - Buchanan**

06	1200EST	0	0	Record Warmth
	1800EST			

Afternoon temperatures reached into the low and mid 70s along the river valleys. Clintwood had 70 degrees, while Grundy registered 75 degrees.

VAZ003>004

**Dickenson - Buchanan**

23	1300EST	0	0	Ice Storm
24	0700EST			

A quarter to a half inch of ice was deposited by freezing rain. The water equivalent of the precipitation was 0.20 to 0.50 inches. Small branches were broken off. Some power outages were reported in Dickenson County.

## VIRGINIA, Southwest

VAZ007-009>020-  
022>024-032>035-  
043>047-058>059

**Tazewell - Smyth - Bland - Giles - Wythe - Pulaski - Montgomery - Grayson - Carroll - Floyd - Craig - Alleghany - Bath - Roanoke - Botetourt - Rockbridge - Patrick - Franklin - Bedford - Amherst - Henry - Pittsylvania - Campbell - Appomattox - Buckingham - Halifax - Charlotte**

23	0800EST	0	0	Ice Storm
24	1400EST			

Sleet and freezing rain developed during the morning hours on the 23rd and continued into late afternoon hours. Freezing rain redeveloped overnight and continued into the late morning and early afternoon hours on the 24th. Ice accumulated from 1/4 to 1/2 inch on exposed objects in most areas. However, there was some ice accumulations around one inch. The weight of the ice downed trees limbs and power lines which resulted in numerous power outages. Some people were without power for a few days. Ice covered roads and bridges resulted in numerous traffic accidents and some injuries. A traffic accident in Richlands in Tazewell County resulted in two fatalities.

## WASHINGTON, Northeast

WAZ033>038-  
042>044

**Washington Palouse - Moses Lake Area - Upper Columbia Basin - Spokane Area - Northeast Mountains - Okanogan Highlands - East Slopes Northern Cascades - Okanogan Valley - Waterville Plateau**

01	0600PST	0	0	0	0	Heavy Snow
28	2200PST					

Several reports of 4-15 inches of snow fell in a 12 hour period each day. The highest amount was 23" near Plain. Other locations that received heavy snow were Republic, Chewelah, Leavenworth, Omak, Deer Park, Pullman, Meatalin, Waconda, Wilbur, Waterville and Quincy. Several highway accidents were reported from the snow and icy roads.

WAZ032

**Lower Garfield & Asotin**

27	1700PST	0	0	20K	0	High Wind
	2300PST					

Winds of 50-60 mph ripping through Pomeroy causing roof damage to several buildings and taking a garden shed down. Heavy rain also accompanied the wind.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## WASHINGTON, Northeast

### Whitman County

**Pullman** 27 2100PST 0 0 50K 0 Flood  
28 0500PST

Rapid snowmelt and 2-4 inches of rain lead to flooding of small creeks and streams around Pullman. Portions of the WSU campus experienced flooding, while several downtown businesses and city streets were inundated by a foot of water. Portions of Highway 195 were closed.

### Chelan County

**Cashmere to** 28 0900PST 0 0 80K 0 Flood  
**Entiat** 29 1700PST

An ice jam on Mission Creek in addition to rapid snow melt caused flooding from Cashmere to Entiat. Several basements of homes and structures were flooded, included a few downtown businesses in Cashmere. Portions of Highway 28 were closed. Douglas Creek also caused some minor flooding.

## WASHINGTON, Northwest

### WAZ001

#### San Juan

01 0115PST 0 0 0 High Wind

A spotter reported sustained winds of 40 mph.

### WAZ001

#### San Juan

05 0850PST 0 0 High Wind (G52)

A spotter in Friday Harbor reported sustained winds of 40 mph with gusts to 60 mph.

### Island County

**15 N Oak Harbor** 06 0200PST 0 0 50K Tstm Wind/Hail  
0202PST

A large amount of small hail or ice pellets combined with wind partially sunk one boat and damaged two others.

### WAZ005>007-010-016

#### Northwest Interior - Everett And Vicinity - Seattle Metropolitan Area - Hood Canal/Kitsap Peninsula - Central Coast

19 1230PST 0 0 Winter Storm  
1530PST

After two to four inches of snow fell, there was significant disruption of traffic throughout the affected areas. People driving over the Hood Canal Bridge were stuck in traffic for about 3 hours. There were two deaths that were indirectly caused by the snow and its effect on the roads.

### WAZ002>005-007>011

#### Western Whatcom - Northern Casade Foothills - Central Casade Foothills - Northwest Interior - Seattle Metropolitan Area - Tacoma Area - Admiralty Inlet Area - Hood Canal/Kitsap Peninsula - Southwest Interior

24 0100PST 0 0 Heavy Snow  
0800PST

4 to 8 inches of snow fell over much of Puget Sound. The snowfall knocked out power to about 1000 customers and caused hundreds of minor car accidents.

### WAZ010

#### Hood Canal/Kitsap Peninsula

25 2145PST 0 0 0 High Wind

A spotter in Shelton reported sustained winds of 40 mph.

### Grays Harbor County

**Elma** 27 0000PST 0 0 200K Heavy Rain  
28 2300PST

Heavy rain over a two day period caused damage to the Elma High School. The heavy rain also triggered mudslides, one which knocked a house off its foundation in Gig Harbor. SeaTac set a new two month precipitation record after 21.42 inches fell in Nov and Dec of 1998.

### WAZ018

#### West Slopes Central Cascades And Passes

27 0600PST 0 0 Heavy Snow  
1800PST

More than a foot of snow, plus some sleet, forced the DOT to close I-90 over Snoqualmie Pass. About 4000 travellers were prevented from crossing over the mountains as Stevens Pass was closed as well.

## WASHINGTON, Southeast

### WAZ026-030

#### Kittitas Valley - Northwest Blue Mountains

01 0000PST 0 0 Heavy Snow  
03 0500PST

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		

December 1998

## WASHINGTON, Southeast

Three inches of snow fell overnight at an elevation of 2400 feet.

WAZ025>027

**East Slopes Southern Cascades - Kittitas Valley - Yakima Valley**

05	1300PST	0	0	Heavy Snow
	1600PST			

Two to three and a half inches of snow fell in three hours around an elevation of 2200 feet.

WAZ030

**Northwest Blue Mountains**

07	1700PST	0	0	Heavy Snow
08	1700PST			

Fifteen inches of snow fell in 24 hours at an elevation of 4500 feet.

WAZ027>030

**Yakima Valley - Lower Columbia Basin - Blue Mountain Foothills - Northwest Blue Mountains**

24	0000PST	0	0	Winter Storm
	1200PST			

A Christmas Eve storm brought a half inch to two inches of snow to the lowest elevations and up to three inches of snow to the mountains. Temperatures were in the upper teens to lower 20s.

WAZ025>030

**East Slopes Southern Cascades - Kittitas Valley - Yakima Valley - Lower Columbia Basin - Blue Mountain Foothills - Northwest Blue Mountains**

25	0600PST	0	0	Winter Storm
	2200PST			

A Christmas Day storm brought a combination of snow and freezing rain to Central and Southeast Washington. Up to four inches of snow fell in the higher elevations of Yakima and Kittitas counties and thirteen inches fell in the mountains of southeast Washington. Freezing rain and sleet fell across the lower elevations and caused treacherous driving conditions. In Yakima county alone, state troopers responded to more than 80 traffic accidents. Most did not involve serious injuries. In southeast Yakima county, one tractor trailer rolled over and blocked an off-ramp for several hours. Another jackknifed truck blocked traffic for more than a mile. Strong wind with this storm apparently caused a power outage for about two hours in western Klickitat County.

WAZ025-025

**East Slopes Southern Cascades**

25	1800PST	0	0	High Wind (G45)
31	1420PST			

High wind caused two separate power outages in Klickitat County on Christmas night. In both cases, trees were knocked over power lines. In all, close to 1,000 customers lost power.

WAZ025>026

**East Slopes Southern Cascades - Kittitas Valley**

27	0700PST	0	0	Heavy Snow
	1900PST			

Nearly 18 inches of snow fell along Interstate 90 at Snoqualmie Pass before changing to sleet and freezing rain. Up to ten inches of snow fell in the East Slopes of the southern Washington Cascades and up to three inches of snow fell in the Kittitas valley before it changed to rain during the afternoon. Washington Department of Transportation closed Interstate 90 through Snoqualmie Pass and Highway 2 through Stevens Pass by early afternoon because of avalanche danger. Both roads are major traffic routes to Seattle. As many as 3,000 holiday travellers spent the night in Cle Elum and 6,000 in Ellensburg. Central Washington University in Ellensburg opened 800 dorm rooms for stranded travellers. By early evening, hotels were full and the American Red Cross set up shelters. Up to 800 people stayed in Red Cross shelters while others spent the night in their vehicles. The roads through the passes were opened around noon on the 28th after the snow was removed and avalanche control measures were taken.

WAZ028

**Lower Columbia Basin**

27	2000PST	0	0	High Wind (G50)
	2330PST			

A peak wind gust of 58 mph was reported in West Richland at 8:20 pm. Wind gusts of 35 to 55 mph were reported until at least 9 pm. Wind gusts to 48 mph were reported at the Tri-Cities Airport. On Interstate-82 near Kennewick, a semi-trailer over turned and a camper was blown off a truck. Neither incident involved serious injuries. Many trees, branches, and street signs were blown down. Roof damage on houses was reported from Benton City to Finley to Pasco.

WAZ025>027

**East Slopes Southern Cascades - Kittitas Valley - Yakima Valley**

28	1100PST	0	0	Flood
31	1000PST			

Three roads southwest of Sunnyside were closed when water from Satus Creek covered them. Two of the roads were opened the next day. The other road was closed for a week because of pavement damage. A road was also closed by high water in the Tieton area. High water in rivers and streams caused flooding problems in the Cle Elum and Ellensburg areas. Eight people evacuated their homes near Cle Elum. At least four homes were invaded by water. Nearly a dozen roads were closed at times due to water in the north and west parts of Ellensburg.

# Storm Data and Unusual Weather Phenomena

		Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Persons Injured	Estimated Damage Property	Crops	Character of Storm
December 1998									
WASHINGTON, Southwest									
WAZ021	South Coast								
	01	0400PST			0	0			High Wind (G45)
	02	0400PST							
	December got off to a stormy start. Cape Disappointment reported 52 mph the morning of the 1st, and high winds continued until early the 2nd.								
WAZ021	South Coast								
	02	0000PST			0	0			Flood
	03	0000PST							
	Minor flooding occurred on the Willapa River after heavy rain on the 1st.								
WAZ021	South Coast								
	05	0300PST			0	0			High Wind (G55)
		1200PST							
	A relatively minor Pacific storm caused wind gusts to 63 mph at Cape Disappointment.								
WAZ019-039	West Slopes Southern Cascades And Passes - Vancouver Area								
	05	1400PST			0	0			Heavy Snow
	06	1700PST							
	Snow accumulations of 1 to 3 inches were reported in Southwest Washington. Battle Ground reported 3 inches of new snow.								
WAZ021	South Coast								
	07	1600PST			0	0			High Wind (G38)
		2300PST							
	Cape Disappointment reported 45 mph winds.								
WAZ021	South Coast								
	12	1300PST			0	0			High Wind (G37)
	13	1000PST							
	Cape Disappointment reported winds of 43 mph with another Pacific storm.								
WAZ019>023-039>040	West Slopes Southern Cascades And Passes - Southwest Interior - South Coast - Lower Columbia - West Columbia River Gorge - Vancouver Area - Southern Cascade Foothills								
	18	0000PST			0	0			Extreme Cold
	24	0800PST							
	An extensive arctic airmass spread over the entire Pacific Northwest the week before Christmas. Temperatures fell sharply beginning December 18 and were coldest around the Winter Solstice December 21. High temperatures were only in the teens and 20s then. The lowest temperatures in Southwest Washington were in the Cascades, where overnight lows fell into the teens below zero. Light snow, less than one inch amounts, fell on the 19th and 21st, causing widespread traffic problems. Numerous accidents on Interstate 5 near the Oregon/Washington border during rush hour on the 21st caused a massive traffic jam. Plumbers were kept busy repairing frozen and burst water pipes.								
WAZ019-039>040	West Slopes Southern Cascades And Passes - Vancouver Area - Southern Cascade Foothills								
	24	0000PST			0	0			Heavy Snow
		1200PST							
	A Christmas Eve storm threatened to deliver a white Christmas to Southwest Washington. However, the 2 to 5 inches of snow that feel from around midnight to mid morning melted by afternoon as temperatures warmed. Battle Ground reported 4 inches of new snow, while the Vancouver area had around 3 inches.								
WAZ021>022	South Coast - Lower Columbia								
	25	0800PST			0	0			High Wind (G45)
		2100PST							
WAZ023	West Columbia River Gorge								
	25	0800PST			0	0			Ice Storm
		2300PST							
	A Christmas Day Pacific storm brought high winds to the coast and Kelso/Longview area, freezing rain to the Columbia River Gorge, and heavy rain to Southwest Washington, which contributed to a major flood episode a few days later. Winds at Cape Disappointment along the reached 52 mph, while many trees were blown down and roofs damaged in the Kelso/Longview area. The last of the cold air from the arctic outbreak the previous week filtered through the Columbia River Gorge and caused freezing rain that created hazardous holiday driving conditions on State Highway 14.								
WAZ021	South Coast								
	27	0800PST			0	0			High Wind (G45)
	28	2100PST							
	The last powerful Pacific storm of this stormy month caused winds of 52 mph at Cape Disappointment. Heavy rain also fell December 27 and 28.								

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## WASHINGTON, Southwest

**WAZ020>021**

**Southwest Interior - South Coast**

**27 1200PST 0 0 500K Flood**  
**30 1200PST**

A Pacific storm on December 27-28 dumped 2 to 5 inches of rain in lowlands and 6 to 10 inches of rain in the Coast Range. This deluge, on top of heavy rain December 25-26, combined with saturated soils and a rapidly melted heavy low elevation snowpack and frozen subsurface soils from the pre-Holiday arctic outbreak to create widespread lowland flooding. The Willapa and Cowlitz River areas were the hardest hit, but fortunately the rain ended December 28 and flood waters receded rapidly. Many highways were closed due to slides and washouts, especially along the coast and Coast Range. Fortunately, no deaths or serious injuries were reported during this episode.

## WEST VIRGINIA, East

**WVZ048>055**

**Grant - Mineral - Hampshire - Morgan - Berkeley - Jefferson - Pendleton - Hardy**

**01 0000EST 0 0 Drought**  
**31 2359EST**

This was the sixth month in a row that drought conditions were seen across the Eastern Panhandle of West Virginia. Persistent high pressure over the Southeast U.S. forced most precipitation producing low pressure systems to steer north of the region. In addition, record high temperatures baked the region during the first week of the month. Monthly precipitation totals from counties in the region included 0.6 inches in Hampshire, 0.7 inches in Mineral, 0.8 inches in Morgan, 0.9 inches in Hardy, 1.0 inches in Pendleton, and 1.3 inches in Grant and Jefferson. Average precipitation for the month of December is around 3 inches. Most locations received less than half of their normal precipitation from July through December. A ban on open burning continued through mid December in Berkeley, Grant, Hampshire, Jefferson, Mineral, Morgan, and Pendleton Counties due to extreme fire danger.

**WVZ048>049**

**Grant - Mineral**

**31 0400EST 0 0 Winter Weather**  
**1100EST**

A weak upper level disturbance moved across the Appalachian foothills early on December 31st, producing light to moderate snowfall. Between 4:00 and 11:00 AM, this system dropped between a trace and 4.5 inches of snow across the Eastern Panhandle of West Virginia, with the largest amounts across higher elevations of Grant and Mineral Counties. Snowfall totals from this region included Petersburg at 4.2 inches, Bayard at 4.0 inches, and Keyser at 3.5 inches.

## WEST VIRGINIA, North

**WVZ041**

**Tucker**

**17 0700EST 0 0 Heavy Snow**  
**18 0700EST**

A cold front pushing southeast across the Great Lakes brought the first significant snowfall of the season to portions of northern West Virginia. Most locations across this area received snowfall totals in the 1 to 3 inch range. However, persistent northwest winds throughout this 24-hour period produced upslope flow along the higher mountain ridges, which allowed for some isolated higher snowfall totals. Canaan Valley State Park received 8.0 inches of snow during this period.

## WEST VIRGINIA, Southeast

**WVZ042>045**

**Mercer - Summers - Monroe - Greenbrier**

**23 0800EST 0 0 Ice Storm**  
**24 1100EST**

Sleet and freezing rain developed during the morning hours on the 23rd and continued into late afternoon hours. Freezing rain redeveloped overnight and continued into the late morning hours on the 24th. Ice accumulated from 1/4 to 1/2 inch on exposed objects in most areas. The weight of the ice downed trees limbs and power lines which resulted in some power outages. Ice covered roads and bridges resulted in numerous traffic accidents and some injuries.

## WEST VIRGINIA, West

**WVZ005>011-  
013>020-024>040-  
046>047**

**Wayne - Cabell - Mason - Jackson - Wood - Pleasants - Tyler - Lincoln - Putnam - Kanawha - Roane - Wirt -  
Calhoun - Ritchie - Doddridge - Mingo - Logan - Boone - Clay - Braxton - Gilmer - Lewis - Harrison -  
Taylor - McDowell - Wyoming - Raleigh - Fayette - Nicholas - Webster - Upshur - Barbour - Pocahontas -  
Randolph**

**06 0000EST 0 0 Record Warmth**  
**2359EST**

A prolong warm spell from late November continued for the first week of December. The warmest temperatures came on the 6th. Readings of 70 to 75 degrees were common in the lowlands, with 60s in the mountains. The calendar day minimum temperature at Charleston was only 62 degrees for the 6th.

# Storm Data and Unusual Weather Phenomena

December 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## WEST VIRGINIA, West

### **WVZ033>035-037 Mcdowell - Wyoming - Raleigh - Nicholas**

**23 1300EST**  
**24 0700EST**

**0**

**0**

**Ice Storm**

A quarter to a third of an inch of ice was common from freezing rain. The water equivalent of the precipitation was 0.20 to 0.40 inches. Power outages occurred in the community of War. Small branches were broken off trees.

### **WVZ037>038-046>047 Nicholas - Webster - Pocahontas - Randolph**

**29 2300EST**  
**30 0800EST**

**0**

**0**

**Snow**

A 3 to 6 inch snowfall accompanied the arrival of colder air.

## WISCONSIN, Extreme Southwest

NONE REPORTED.

## WISCONSIN, Northeast

### **WIZ030-035>036-039 Marathon - Wood - Portage - Brown**

**01 0600CST**  
**03 2300CST**

**0**

**0**

**Record Warmth**

Record high temperatures were set across central and east-central Wisconsin early in the month. Some of the warmest readings included 56 F at Wausau (Marathon co) and 58 F at Stevens Point (Portage co) on the 1st, 62 F at Marshfield (Wood co) and 61 F at Stevens Point on the 2nd and 64 F at Wisconsin Rapids (Wood co), 60 F at Wausau and 62 F at Green Bay (Brown co) on the 3rd. The 62 F on the 3rd was the warmest temperature ever recorded at Green Bay in December.

### **WIZ005 Vilas**

**19 1000CST**  
**1800CST**

**0**

**0**

**Heavy Snow**

Lake effect snow showers produced an isolated snowfall of 6" in Presque Isle.

### **WIZ035>037-045 Wood - Portage - Waupaca - Waushara**

**20 1000CST**  
**2200CST**

**0**

**0**

**Heavy Snow**

A weak area of low pressure produced a band of 4 to 7 inches of snow across central Wisconsin. The heaviest snow occurred over southern Wood, southern Portage, southern Waupaca and northern Waushara counties, where 7 inches fell.

## WISCONSIN, Northwest

### **WIZ004 Iron**

**19 0930CST**  
**1800CST**

**0**

**0**

**Heavy Snow**

Up to nine inches of lake effect snow fell in northern Iron county.

### **WIZ002>004 Bayfield - Ashland - Iron**

**29 0415CST**  
**1600CST**

**0**

**0**

**Heavy Snow**

Lake effect snow, including 7 inches in Bayfield and 8 inches in Upsan, fell across the northern Wisconsin snow belt.

## WISCONSIN, Southeast

### **WIZ046>047-051>052-056>060-062>072 Marquette - Green Lake - Fond Du Lac - Sheboygan - Sauk - Columbia - Dodge - Washington - Ozaukee - Iowa - Dane - Jefferson - Waukesha - Milwaukee - Lafayette - Green - Rock - Walworth - Racine - Kenosha**

**01 0000CST**  
**06 1000CST**

**0**

**0**

**Excessive Heat**

A historical heat wave, which started in late November, 1998, continued into the early morning hours of December 6th over southcentral and southeast Wisconsin. Numerous new daily record maximum temperatures were set, as well as some new daily record high minimums. The length of the heat wave was an unbelievable 15 days, and involved daytime temperatures in the 50s and 60s, and overnight lows in the mid 30s to lower 50s. Normal highs are in the mid 30s and normal lows in the upper teens to mid 20s. The high of 64 in Milwaukee (Milwaukee Co.) on December 3rd became the warmest maximum reading ever recorded for the entire month of December. The high of 62 in Madison (Dane Co.) on December 5th tied the warmest maximum reading for the entire month of December. A high of 65 in Sheboygan (Sheboygan Co.) on December 3rd became the warmest maximum reading ever recorded for the entire month of December.

The record warmth allowed some plants to become active again. Some farmers noted that winter wheat started to sprout. There were numerous reports of dandelion weeds blooming, lilac bushes budding, and tulip flowers popping their stems up.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	December 1998	
					Killed	Injured	Property	Crops	Character of Storm

## WISCONSIN, Southeast

Here's a breakdown on the records:

December 3...Milwaukee...new daily record maximum of 64, and new record maximum for December.

Madison...new daily record maximum of 61, and lows of 43 tied daily record high minimum.

Racine...new daily record maximum of 65.

Sheboygan...new daily record maximum of 65, and new record maximum for December.

Kenosha...new daily record maximum of 64.

December 4...Milwaukee...new daily record high minimum of 46.

Madison...new daily record high minimum of 47.

December 5...Milwaukee...new daily record maximum of 61, and new daily record high minimum of 45.

Madison...new daily record maximum of 62, and new daily record high minimum of 52 which was the warmest so late in the season.

December 6...Milwaukee...new daily record maximum of 56.

Madison...new daily record maximum of 56.

## WISCONSIN, Southwest

NONE REPORTED.

## WISCONSIN, West

NONE REPORTED.

## WYOMING, Central and West

### **WYZ001>002-006 Yellowstone National Park Mt Id - North Absarokas - Teton/Moutains**

25 1000MST 0 0 Heavy Snow

26 1500MST

Up to a foot and a half of snow in the northwest mountains.

### **WYZ014 Green Mountains**

26 0330MST 0 0 High Wind (G50)

1330MST

Sustained winds 40 to 50 mph.

### **WYZ001-006>007-016 Yellowstone National Park Mt Id - Teton/Moutains - Jackson Valley - Star Valley**

27 1000MST 0 0 Winter Storm

28 1100MST

Around one foot of new snow in the valleys, up to 3 feet in the mountains. Considerable blowing and drifting snow caused occasional whiteout conditions in the Star Valley. Beginning and ending times are estimates.

### **WYZ012-014>015 Lander Foothills - Green Mountains - Natrona**

28 0200MST 0 0 High Wind (G67)

0800MST

Sustained winds 40 to 50 mph in the Lander and Casper areas.

## WYOMING, Extreme Southwest

NONE REPORTED.

## WYOMING, North Central

### **WYZ099 Sheridan Foothills**

26 0500MST 0 0 High Wind (G45)

1030MST

A strong low pressure system moved across Central Montana and produced a series of mountain waves across the Sheridan Foothills. The Sheridan Airport reported sustained winds at 43 mph with gusts to 52 mph at 600 am.

## WYOMING, Northeast

NONE REPORTED.

# Storm Data and Unusual Weather Phenomena

									December 1998
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<b>WYOMING, Southeast</b>									
<b>WYZ062-067</b>	<b>North Carbon - Platte</b>								
	<b>07</b>	<b>1900MST 2200MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G56)</b>
	Strong west winds of 30 to 40 mph occurred across Platte and northern Carbon counties, with gusts to over 60 mph.								
<b>WYZ069</b>	<b>Cheyenne Foothills</b>								
	<b>09</b>	<b>0600MST 0900MST</b>			<b>0</b>	<b>1</b>	<b>30K</b>	<b>0</b>	<b>Icy Roads</b>
	Icy roads brought the closure of Interstate 25 from Cheyenne south to the Colorado border. 6 traffic accidents occurred on Interstate 25 and 3 occurred on Interstate 80 on the icy roads. One person in one of the accidents sustained minor facial injuries.								
<b>WYZ063&gt;064-066&gt;067</b>	<b>Snowy Range - North Laramie Range - Laramie Range - Platte</b>								
	<b>17</b>	<b>0945MST 1544MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G60)</b>
	Strong west to southwest winds of 35 to 45 mph with gusts over 60 mph occurred in parts of the southeast mountains and adjacent plains. A peak gust of 61 mph was reported at Arlington at 0945.								
<b>WYZ067</b>	<b>Platte</b>								
	<b>17</b>	<b>1900MST 2220MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G52)</b>
	Strong west winds of 40 to 50 mph occurred across Platte County with gusts over 60 mph.								
<b>WYZ061&gt;063-066-069&gt;070</b>	<b>Southwest Carbon - North Carbon - Snowy Range - Laramie Range - Cheyenne Foothills - Pine Bluffs</b>								
	<b>18 19</b>	<b>1540MST 0900MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Winter Storm</b>
	A winter storm dumped 12 to 18 inches of snow on the southeast mountains, and 8 to 10 inches of snow on parts of the adjacent plains. Interstates 80 and 25 in southeast Wyoming were closed due to icy conditions and poor visibilities.								
<b>WYZ063&gt;064-066&gt;067</b>	<b>Snowy Range - North Laramie Range - Laramie Range - Platte</b>								
	<b>24 25</b>	<b>2100MST 1300MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G63)</b>
	West winds of 25 to 40 mph, with gusts over 60 mph occurred in the southeast mountains and adjacent plains.								
<b>WYZ067</b>	<b>Platte</b>								
	<b>25 26</b>	<b>2300MST 1408MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G70)</b>
	A peak gust of 81 mph was reported 1 mile south of Wheatland at 0612.								
<b>WYZ059-061&gt;066-069</b>	<b>Converse - Southwest Carbon - North Carbon - Snowy Range - North Laramie Range - Laramie Valley - Laramie Range - Cheyenne Foothills</b>								
	<b>26</b>	<b>0430MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G57)</b>
	West winds were sustained at 30 to 45 mph across southeast Wyoming, with gusts up to 65 mph.								
<b>WYZ069</b>	<b>Cheyenne Foothills</b>								
	<b>26</b>	<b>1108MST</b>			<b>1</b>	<b>1</b>	<b>12K</b>	<b>0</b>	<b>Icy Roads</b>
	One person was killed, when the car she was riding in hit a patch of ice on Interstate 25, 25 miles north of Cheyenne. The car rolled across the highway, throwing the victim partly out of the car and pinning her beneath it. The driver of the car was also injured.								
	F46VE								
<b>WYZ062-065-067-069</b>	<b>North Carbon - Laramie Valley - Platte - Cheyenne Foothills</b>								
	<b>28</b>	<b>0330MST 1700MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G67)</b>
	Strong west winds of 30 to 45 mph occurred in the southeast mountains and adjacent plains, with gusts over 70 mph.								
<b>WYZ061&gt;067</b>	<b>Southwest Carbon - North Carbon - Snowy Range - North Laramie Range - Laramie Valley - Laramie Range - Platte</b>								
	<b>29 30</b>	<b>1540MST 1700MST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>High Wind (G63)</b>
	Strong west winds of 30 to 45 mph occurred across southeast Wyoming. Gusts were over 70 mph in the mountains and 60 mph across the plains.								

# Storm Data and Unusual Weather Phenomena

January 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### FLORIDA, West Central

#### Hernando County

Pine Is to	02	2100EST			0	0	25K	0	Storm Surge
Bayport	03	0200EST							

#### Pasco County

Hudson to	02	2100EST			0	0	1.8M	0	Storm Surge
New Port Richey	03	0300EST							

#### Hillsborough County

Appollo Beach to	02	2200EST			0	0	0	0	Storm Surge
Tampa	03	0300EST							

#### Manatee County

Anna Maria to	02	2200EST			0	0	200K	0	Storm Surge
Longbeach	03	0300EST							

#### Pinellas County

Anclote to	02	2200EST			0	0	200K	0	Storm Surge
St Petersburg Beach	03	0300EST							

Storm surges, several feet above normal astronomical tides, developed ahead and with a north northeast to south southwest oriented squall line that moved east at 40 to 50 mph nearly perpendicular to Florida's West coast.

In Pinellas county, storm surges were 5.5 to 6.0 feet above astronomical tides. Nearly 300 homes were damaged by floodwaters that averaged about 4 to 6 inches in depth from Hudson Beach to New Port Richey. The most impacted were the Signal Cove and Driftwood Isles subdivisions in Hudson Beach and the Manor Beach and Green Key Estates subdivisions in New Port Richey.

In Manatee county, storm surges were 3.0 to 4.0 feet above astronomical tides. Less than 50 homes were damaged and coastal roads were closed by the floodwaters while several boats were washed into the streets from Anna Maria south to Longbeach.

In Pinellas county, storm surges were 3.0 to 4.0 feet above astronomical tides. Less than 25 homes and two businesses were damaged and a few coastal roads were closed by floodwaters mainly from Tarpon Springs south to Clearwater.

In Hernando county, storm surges were 2.0 to 3.0 feet above astronomical tides. The surge caused minimal water over seawalls and minor coastal road flooding.

In Hillsborough county, storm surges were 2.0 to 3.0 feet above astronomical tides which did not cause any reported localized flooding.

### TEXAS, Central Southeast

#### Chambers County

Oak Island	06	0510CST			0	0	5K		Hail (0.88)
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#### Galveston County

Galveston	06	0635CST 0900CST			0	0	5K		Flash Flood
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High water on Broadway, 45th-47th St, 53rd St, 61st St. on Galveston Island

#### Chambers County

Northwest Portion	06	0805CST 1115CST			0	0	5K		Flash Flood
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High water on HWY 146 & I-10.

#### Liberty County

Dayton	06	0952CST 1345CST			0	0	3K		Flash Flood
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FM 1409 & Champions Rd near Dayton had 2 feet of water on it.

#### Brazos County

College Station	06	1430CST 1545CST			0	0	5K		Flash Flood
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Street flooding in Bryan/College Station.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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January 1998

## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

#### **Burleson County**

Countywide	06	1430CST 1545CST			0	0	3K		Flash Flood
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Street flooding across the county.

#### **Houston County**

South Portion	06	1500CST 1700CST			0	0	3K		Flash Flood
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High water on FM 1280.

#### **Polk County**

Countywide	06	1500CST 1930CST			0	0	25K		Flash Flood
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Moderate flooding across the county. FM 1988 at HWY 146 flooded. Bridge washed out at FM 942 between Corrigan and Camden.

#### **Trinity County**

Trinity	06	1500CST			0	0	3K		Flash Flood
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Street flooding in Trinity.

#### **Liberty County**

Countywide	06	1515CST 2245CST			0	0	10K		Flash Flood
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Moderate street flooding countywide.

#### **Chambers County**

Northwest Portion	06	1630CST 1845CST			0	0	5K		Flash Flood
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HWY 146 & I-10 closed due to high water. FM 565 flooded.

#### **Montgomery County**

Countywide	06	1630CST 2300CST			0	0	20K		Flash Flood
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Major flooding throughout the county, especially the Magnolia/Montgomery areas. HWY 1097, and FM 1097 at I-45 closed due to high water. Magnolia Bend Subdivision evacuated at 2250 CST due to rising water.

#### **Galveston County**

Dickinson	06	1632CST			0	0	2K		Thunderstorm Wind (G60)
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60 mph gust at NWSO Houston/Galveston.

#### **Harris County**

Webster	06	1640CST			0	0	2K		Thunderstorm Wind (G60)
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60 mph gusts and large tree limbs down at Bay Area Blvd & FM 528

#### **Harris County**

Bellaire	06	1700CST 1925CST			0	0	3K		Flash Flood
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Street flooding.

#### **San Jacinto County**

Countywide	06	1715CST 2245CST			0	0	5K		Flash Flood
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Numerous roads closed across the county due to high water.

#### **Harris County**

Bellaire	06	1945CST 2130CST			0	0	2K		Flash Flood
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Street flooding

#### **Brazoria County**

Pearland	06	2150CST 2315CST			0	0	2K		Flash Flood
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Street flooding.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		January 1998
					Killed	Injured	Property	Crops	Character of Storm

## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

#### Montgomery County

Countywide	06	2345CST			0	0			Flood
	07	0450CST							

Runoff from earlier heavy rains continue widespread street flooding.

#### San Jacinto County

Countywide	06	2345CST			0	0			Flood
	07	0450CST							

Runoff from earlier heavy rains continue widespread street flooding.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	February 1998
					Killed	Injured	Property Crops	Character of Storm

## ADDITIONS/CORRECTIONS

### AMERICAN SAMOA

#### ASZ001>004

#### Swains - Tutuila - Manu'A - Rose

01	0000SST	0	0	Drought
28	2359SST			

Conditions for February were abnormal due to the continuing influence of El Nino. The average rainfall in February is 12.76 in. at WSO-Pago Pago, but the total rainfall reported for this month was 2.02 in., or 16% of rainfall for the month of February.

### FLORIDA, East Central

#### Volusia County

5 SW Daytona Beach to Daytona Beach	22	2255EST 2305EST	8	150	1	3	4M	Tornado (F2)
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The first tornado in a major tornado outbreak set down along Route 92 about 5 miles southwest of Daytona Beach. The category F2 tornado moved about 8 miles to the northeast passing over the junction of Interstate 95 and Interstate 4 and finally lifted in the south part of Daytona Beach west of the Intracoastal Waterway. Six hundred structures were damaged or destroyed. One person was killed in a mobile home and three others were injured. M41MH

#### Lake County

5 SSE Clermont to 7 ESE Clermont	22	2337EST 2341EST	4	200	0	0	0	Tornado (F3)
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The second tornado of the outbreak touched down in Lake County just east of Lake Louisa along Highway 27. It moved northeast at 45 mph through a rural area blowing down trees but otherwise causing little property damage. At 11:41 pm the tornado moved into Orange County.

#### Orange County

5 SW Winter Garden to Piedmont	22 23	2341EST 0000EST	14	200	3	70	15M	Tornado (F3)
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The Lake County tornado moved into Orange County about 5 miles southwest of Winter Garden moving northeast at 45 mph. It rapidly intensified to a category F3 tornado with estimated winds near 200 mph. The tornado moved through Winter Garden between 11:47 pm and 11:55 pm destroying a mobile home community in Winter Garden. There were three fatalities and 70 injuries. Five hundred structures were either damaged or destroyed.

F68MH, M80MH, M80MH

#### Seminole County

Longwood to 5 E Sanford	23	0010EST 0025EST	14	200	12	36	30M	Tornado (F3)
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The Seminole County category F3 tornado was produced by the same supercell that produced the Winter Garden tornado. It initially set down near Longwood and moved northeast at 45 mph. The tornado passed through several neighborhoods in the southeast portion of Sanford killing 12 people in mobile homes and injuring 70. It continued northeast and crossed into Volusia County 5 miles east of Sanford. The near 200 mph winds of the tornado damaged or destroy 625 structures.

M9MH, F11MH, F21MH, M23MH, M26MH, M37MH, F39MH, F40MH, M41MH, M49MH, M53PH, M62MH

#### Volusia County

4 S Osteen	23	0025EST 0028EST	2	200	1	0	1M	Tornado (F3)
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The Sanford tornado crossed into Volusia County near Highway 46 and the St. Johns River where it killed a 53 year old man in a recreational vehicle at a fish camp. The tornado continued northeast for 2 miles and dissipated in a rural part of south Volusia County.

M53VE

#### Osceola County

1 SE Intercession City to 6 N St Cloud	23	0040EST 0055EST	14	250	25	145	50M	Tornado (F3)
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# Storm Data and Unusual Weather Phenomena

February 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### FLORIDA, East Central

The deadliest tornado of the outbreak was a category F3 that touched down initially one mile south of Intercession City. The tornado moved northeast at 45 mph and ripped through the town of Kissimmee killing 25 people. The hardest hit areas were the Morningside Acres mobile home community and the Ponderosa Recreational Vehicle Park. In all eight people were killed in recreational vehicles, fifteen in mobile homes and one in an automobile. The tornado continued northeast and moved into Orange County six miles north of St. Cloud. One hundred and fifty people were injured and over 1000 structures were damaged or destroyed.

M1MH, M22MH, M23MH, M30VE, F31MH, F33MH, M38MH, F45MH, F47MH, M50MH, M51VE, M55MH, F64VE, F65MH, F66MH, F67MH, M69VE, F70VE, F71VE, M71VE, M73VE, F75MH, F85VE, M51VE, M33VE

#### **Volusia County**

<b>5 W Oak Hill to Ariel</b>	<b>23</b>	<b>0045EST 0052EST</b>	<b>5</b>	<b>150</b>	<b>0</b>	<b>0</b>	<b>500K</b>	<b>Tornado (F2)</b>
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The same supercell that produced the Sanford tornado produced an F2 tornado that touched down just west of Interstate 95 about 5 miles west of Oak Hill. The tornado moved northeast at 45 mph blowing down trees destroying two barns and damaging 10 mobile homes and 2 houses. The tornado lifted at the town of Ariel at U.S. Highway 1.

#### **Orange County**

<b>3 SW (Mco)Orlando Intl Ar</b>	<b>23</b>	<b>0055EST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>Hail (1.75)</b>
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#### **Orange County**

<b>4 SE (Mco)Orlando Intl Ar to 8 ESE Christmas</b>	<b>23</b>	<b>0055EST 0138EST</b>	<b>24</b>	<b>250</b>	<b>0</b>	<b>5</b>	<b>5M</b>	<b>Tornado (F3)</b>
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The Kissimmee tornado moved into Orange County southeast of Orlando International Airport as a category F3. The tornado affected rural swampy areas, striking few structures except for lakeside neighborhoods on the shores of Lake Hart and Lake Mary Jane. The tornado lifted as it approached the St. Johns River on the east central border of Orange County in the Tosohatchee State Preserve.

#### **Brevard County**

<b>3 NE Titusville Ti Co Arp</b>	<b>23</b>	<b>0138EST</b>	<b>1</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>500K</b>	<b>Tornado (F1)</b>
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The supercell that produced the Kissimmee / Orange County tornado produced another category F1 tornado that touched down in Brevard County just east of Interstate 95 three miles northwest of Titusville Cocoa Airport. The tornado moved northeast at 45 mph and stayed on the ground for only one mile. It blew down trees and damaged 4 houses.

#### **Brevard County**

<b>Port Canaveral</b>	<b>23</b>	<b>0230EST</b>	<b>1</b>	<b>75</b>	<b>0</b>	<b>0</b>	<b>1M</b>	<b>Tornado (F1)</b>
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The final tornado of the outbreak was a waterspout/tornado that moved onshore at Port Canaveral from the Banana River Lagoon. The F1 tornado damaged 30 structures and lifted before reaching the Atlantic Ocean.

### MISSISSIPPI, Central

#### **Adams County**

<b>Natchez</b>	<b>26</b>	<b>1010CST</b>			<b>0</b>	<b>4</b>	<b>30M</b>	<b>Thunderstorm Wind (G70)</b>
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An intense line of thunderstorms or bow echo configuration moved across the Mississippi River and struck the city of Natchez. Strong outflow from the bow echo produced estimated winds of 80 to 100 miles an hour in the city. These strong winds damaged many of the historic buildings and peeled roofs off of many of the buildings. Numerous windows were broken out of buildings and debris was scattered over a three mile wide area. Four people were injured but none of the injuries were serious. Numerous trees were also blown down.

#### **Jefferson County**

<b>Fayette to Union Church</b>	<b>26</b>	<b>1020CST 1040CST</b>			<b>0</b>	<b>0</b>	<b>100K</b>	<b>Thunderstorm Wind</b>
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Thousands of trees were blown down in eastern Jefferson county. A few buildings were also damaged.

#### **Franklin County**

<b>Little Spgs</b>	<b>26</b>	<b>1030CST</b>			<b>0</b>	<b>0</b>	<b>50K</b>	<b>Thunderstorm Wind</b>
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The roofs of two houses were blown off. Hundreds of trees were blown down.

#### **Claiborne County**

<b>2 SE Port Gibson to 1 E Rocky Spgs</b>	<b>26</b>	<b>1050CST 1110CST</b>	<b>13</b>	<b>1232</b>	<b>0</b>	<b>0</b>	<b>100K</b>	<b>Tornado (F1)</b>
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# Storm Data and Unusual Weather Phenomena

February 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### MISSISSIPPI, Central

This tornado formed in the rotating comma head of a bow echo. The tornado moved through a mostly wooded area and blew down hundreds of trees. It took much of the day to remove trees from the Natchez Trace Parkway before traffic could resume. One house had a tree fall on it and a mobile home had the major damage.

#### **Copiah County**

<b>Crystal Spgs</b>	<b>26</b>	<b>1100CST</b>			<b>0</b>	<b>0</b>	<b>10K</b>		<b>Thunderstorm Wind</b>
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Numerous trees were blown down throughout the county.

#### **Warren County**

<b>Bovina</b>	<b>26</b>	<b>1105CST</b>			<b>0</b>	<b>0</b>	<b>20K</b>		<b>Thunderstorm Wind</b>
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Extensive damage was done to barns and trees.

#### **Warren County**

<b>Vicksburg</b>	<b>26</b>	<b>1106CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>		<b>Thunderstorm Wind</b>
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A number of trees were blown down in Vicksburg.

#### **Lincoln County**

<b>10 N Brookhaven to Brookhaven</b>	<b>26</b>	<b>1112CST</b>			<b>0</b>	<b>0</b>	<b>2K</b>		<b>Thunderstorm Wind</b>
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Several trees were blown down.

#### **Hinds County**

<b>Jackson</b>	<b>26</b>	<b>1115CST</b>			<b>0</b>	<b>0</b>	<b>10K</b>		<b>Thunderstorm Wind</b>
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Numerous trees were blown down throughout the county.

#### **Lawrence County**

<b>Sontag</b>	<b>26</b>	<b>1125CST</b>			<b>0</b>	<b>0</b>	<b>2K</b>		<b>Thunderstorm Wind</b>
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Several trees were blown down.

#### **Madison County**

<b>Gluckstadt</b>	<b>26</b>	<b>1130CST</b>			<b>0</b>	<b>0</b>			<b>Thunderstorm Wind (G52)</b>
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#### **Rankin County**

<b>Richland</b>	<b>26</b>	<b>1130CST</b>			<b>0</b>	<b>0</b>	<b>2K</b>		<b>Thunderstorm Wind</b>
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Several trees and power lines were blown down.

#### **Simpson County**

<b>Mendenhall</b>	<b>26</b>	<b>1135CST</b>			<b>0</b>	<b>0</b>	<b>5K</b>		<b>Thunderstorm Wind</b>
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Many trees were blown down.

#### **Smith County**

<b>Polkville</b>	<b>26</b>	<b>1150CST</b>			<b>0</b>	<b>0</b>			<b>Hail (0.75)</b>
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#### **Simpson County**

<b>Magee</b>	<b>26</b>	<b>1155CST</b>			<b>0</b>	<b>0</b>	<b>2K</b>		<b>Thunderstorm Wind</b>
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Several trees were blown down.

#### **Simpson County**

<b>Mendenhall</b>	<b>26</b>	<b>1200CST</b>			<b>0</b>	<b>0</b>	<b>2K</b>		<b>Thunderstorm Wind</b>
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Several trees were blown down.

#### **Smith County**

<b>Raleigh</b>	<b>26</b>	<b>1220CST</b>			<b>0</b>	<b>0</b>			<b>Hail (0.75)</b>
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#### **Newton County**

<b>Conehatta</b>	<b>26</b>	<b>1230CST</b>			<b>0</b>	<b>0</b>	<b>2K</b>		<b>Thunderstorm Wind</b>
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Several trees were blown down.

#### **Neshoba County**

<b>Philadelphia</b>	<b>26</b>	<b>1240CST</b>			<b>0</b>	<b>0</b>	<b>2K</b>		<b>Thunderstorm Wind</b>
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Trees were blown down.

#### **Lauderdale County**

<b>5 SW Meridian</b>	<b>26</b>	<b>1315CST</b>			<b>0</b>	<b>0</b>	<b>2K</b>		<b>Thunderstorm Wind</b>
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Several trees were blown down.

# Storm Data and Unusual Weather Phenomena

February 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### MISSISSIPPI, Central

#### Clarke County

Stonewall	26	1330CST			0	0			Hail (1.00)
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#### Clarke County

Stonewall	26	1330CST			0	0	2K		Thunderstorm Wind
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Trees were blown down.

#### Newton County

Newton	26	1340CST			0	0	2K		Thunderstorm Wind
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Trees were blown down.

#### Newton County

Newton	26	1340CST			0	0	2K		Thunderstorm Wind
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Several trees were blown down.

#### Marion County

7 E Columbia	26	1445CST			0	0			Hail (0.88)
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#### Jones County

Ellisville	26	1452CST			0	0			Hail (0.75)
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#### Jones County

7 W Ellisville to 7 SW Laurel	26	1453CST 1500CST	5.5	100	0	0	25K		Tornado (F1)
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This tornado moved through a sparsely populated area but did extensive damage to trees.

#### Lamar County

Oak Grove	26	1510CST			0	0	2K		Thunderstorm Wind
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Trees were blown down.

#### Clarke County

Basic City	26	1535CST			0	0			Hail (1.00)
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#### Forrest County

Hattiesburg	26	1540CST			0	0			Hail (0.88)
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#### Jones County

3 E Eastabuchie	26	1600CST			0	0	20K		Thunderstorm Wind
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Two chicken houses were destroyed.

#### Lamar County

Lumberton	26	1600CST			0	0	2K		Thunderstorm Wind
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Several trees were blown down.

## Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm	March 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property			

### ADDITIONS/CORRECTIONS

#### AMERICAN SAMOA

##### Tutuila County

Countywide	08	1100SST		0	0	Heavy Rain
	09	1600SST				

Heavy rainfall was caused by a slow-moving cold front that was over American Samoa. Widespread flooding of low lying areas and roadways were observed during the heavy rainfall, as well as mud and landslides being reported from Poloa/Fagali'i Road and at Avaio in the eastern district. Recorded rainfall by the WSO-Pago Pago for this event was 6.27 in. The normal rainfall for this month is 11.26 in., but the total amount for the month was 12.70 in. at WSO-Pago Pago.

# Storm Data and Unusual Weather Phenomena

April 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### AMERICAN SAMOA

ASZ001>004

Swains - Tutuila - Manu'A - Rose

01 0000SST  
30 2359SST

0 0

Drought

April was a very dry month, based on average temperature and rainfall statistics. The normal for this month is 12.04 in, but the total rainfall at WSO-Pago Pago for this month was 6% or 0.74 in.

### COLORADO, West

COZ004-009>010-012

Elkhead And Park Mountains/Flat Tops/White River Plateau - Grand And Battlement Mesas - Gore And Elk Mountains/Central Mountain Valleys/Aspen And Vicinity - West Elk And Sawatch Mountains/Taylor Park

12 2100MST  
14 0900MST

0 0

Heavy Snow

A moist west to southwest flow generally produced 8 to 12 inches of snow in the higher mountain areas of northwest and west-central Colorado. The heaviest snow totals included 24 inches on the Grand Mesa, 16 inches at Gothic, and 13 inches at the Marvine Ranch in the Flat Tops Mountains.

### Routt County

5 W Milner

14 0400MST  
0430MST

0 0

Flash Flood

Rainfall on melting snow produced a large mudslide which covered a one-quarter mile section of Coal View Road with mud and debris up to 20 feet deep. The mudslide blocked access to the Coal View Guest Ranch and destroyed a shed as well as three utility poles. The mudslide also pushed a trailer close to the banks of the Yampa River.

COZ002-004>005-008>010-012

Central Yampa River Basin/Craig-Hayden And Vicinity - Elkhead And Park Mountains/Flat Tops/White River Plateau - Upper Yampa River Basin/Steamboat Springs And Vicinity - Central Colorado River Basin/Eagle And Vicinity - Grand And Battlement Mesas - Gore And Elk Mountains/Central Mountain Valleys/Aspen And Vicinity - West Elk And Sawatch Mountains/Taylor Park

15 1600MST  
18 0300MST

0 0

Heavy Snow

A very slow moving upper trough produced widespread snowfall across western Colorado, with 10 to 18 inches in most northern and central mountains as well as 6 to 12 inches in some northern valleys. The heaviest reported amounts included 24 inches at Beaver Creek Ski Area, 20 inches at Snowmass Ski Area, and 19 inches at Irwin Lodge.

COZ009>010-012-015-018

Grand And Battlement Mesas - Gore And Elk Mountains/Central Mountain Valleys/Aspen And Vicinity - West Elk And Sawatch Mountains/Taylor Park - Leadville And Vicinity - Northwestern San Juan Mountains

24 2000MST  
25 0300MST

0 0

Heavy Snow

A fast moving disturbance from the Pacific produced 5 to 8 inches of snow in most mountain areas of west-central Colorado.

### SOUTH DAKOTA, Central and North

SDZ007>008-011-018>019

Marshall - Roberts - Day - Spink - Clark

25 1900CST  
26 0300CST

0 0

Flood

Heavy rainfall of 1 to 3 inches with some isolated 5 inch amounts occurred across northern Spink, northern Clark, eastern Roberts, and across most of Day and Marshall counties making a bad flood situation only worse. The area hardest hit with heavy rainfall was eastern Day county in the Webster, Grenville and Roslyn areas. Many years of above normal precipitation had already brought area lakes to record levels creating an ongoing disaster, especially for Day County. And meltwater from 6 inches to around a foot of heavy snow at the end of March added to the high water level. This heavy rain put many area residents over the edge with thousands of residents being affected by the high water. Several homes in the southeast corner of Grenville went under water up to their roofs. Many farm homes and outbuildings became isolated by the highwater. There was only one road that allowed access to Grenville after this rainfall. Water was moving closer to homes across much of the area and thousands of acres of crop and pastureland were swallowed up. Many spots on county and township roads were added to the closed list, which was already in the hundreds. U.S. Highway 12 between Webster and Bristol had to be built up in spots to allow traffic to flow. Extensive sandbagging was done on several of the area lakes to save property, especially on Blue Dog, Rush, and Waubay Lake. Day, Marshall, Spink, Roberts, and Clark counties were all declared a disaster area as a result of the flooding. Some of the heaviest rainfall amounts included, 1.24 inches at Conde, 1.41 inches at Clark, 1.45 inches at Andover, 1.87 inches at Sisseton, 2.81 inches at Britton, 3.30 inches at Webster, and 5 inches at Grenville.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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May 1998

## ADDITIONS/CORRECTIONS

### SOUTH DAKOTA, Central and North

**SDZ006>008-011-  
018>019**      **Brown - Marshall - Roberts - Day - Spink - Clark**

**11      1800CST      0      0      3.8M      Flood**  
**13      0600CST**

Heavy rain of 2 to 4 inches with some amounts nearing 5 inches fell across a large part of the six county area mainly on the evening of the 11th. This round of heavy rain only exacerbated the already extensive flooding occurring from many years of above normal precipitation. Day county was most affected by this round of heavy rain where area lakes were already at new record levels. Blue Dog, Waubay, Rush, and Bitter Lake in Day County were just a few of the lakes hard hit again. In fact, extensive sandbagging was done around Blue Dog Lake to save many homes. Some residents of Blue Dog Lake said they had never seen the lake so high in over 35 years of living there.

Many more roads became flooded after this heavy rain event and will remain so for quite some time. Spots on US Highway 12 and US Highway 25 became flooded near Holmquist and Webster. Also, more of US Highway 212 4 miles east of Clark was flooded. Many area roads had to once again be built up. There remained only one road open to the town of Grenville in northeast Day County. Mail was delayed to many areas due to the road problems. Some school bus drivers said they had never seen rural gravel roads this bad. Also, some railroad tracks were washed out.

In all six counties, the rising water took away many more acres of farm and pastureland, as well as drowning many crops that had already been planted. One farmer in Spink County said sixty percent of his farm was under water. Many farmers were unable to reach their fields because of the flooding. Some farmhouses and outbuildings became surrounded by water leaving some families stranded. After this heavy rain, around sixty percent of the crop and pastureland in Day county and one-third of it in Spink county had been inundated by a swollen water table and several years of above normal precipitation. Overall, the continued flooding has had a tremendous impact on the economy in the six county area. In April, Marshall, Day, Clark, Roberts, and Spink counties were all declared disaster areas as a result of the flooding. Some rainfall amounts included, 2.18 at Aberdeen, 2.29 5NE Peever, 2.41 at Clark, 2.60 at Groton, 2.63 at Conde, 3.10 at Sisseton, 3.60 at Turton, 3.81 at Waubay NWR, 4.01 at Doland, 4.52 at Webster, and 4.7 inches just north of Crocker in Clark county.

# Storm Data and Unusual Weather Phenomena

June 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### AMERICAN SAMOA

#### ASZ002

#### Tutuila

21 1550SST 0 0 High Wind (G43)  
22 2300SST

Bad weather caused flight delays with Sunday night and Monday morning scheduled airline flights between the two Samoas. No flight cancellations were reported. However, high winds and heavy rain caused a power outage on the western side of the main island of Tutuila, cutting power to more than 10,000 American Samoa Power Authority (ASPA) customers. A tree fell on electrical wires, due to high winds, blowing up a transformer in one of the populated areas of the territory. No injuries reported.

### TEXAS, Central Southeast

#### Austin County

Welcome 05 1556CST 0 0 3K Hail (1.00)  
Hail along HWY 109.

#### Brazos County

4 W College Station 05 1600CST 0 0 3K Hail (1.00)  
Hail at BYYT2.

#### Trinity County

Apple Spgs 05 1610CST 0 0 3K Hail (0.75)

#### Trinity County

4 S Trinity 05 1610CST 0 0 0.50K Thunderstorm Wind  
Boat overturned in Lake Livingston by high wind gusts.

#### Grimes County

10 N Navasota 05 1625CST 0 0 10K Hail (1.75)  
Hail on FM 159.

#### Waller County

Hempstead 05 1651CST 0 0 15K Hail (2.00)

#### Austin County

6 N Bellville 05 1700CST 0 0 2K Thunderstorm Wind  
Hurricane fence damaged and trampoline blown 200 yards downwind.

#### Brazos County

4 SSE Wellborn 05 1700CST 0 0 3K Hail (0.88)  
Hail along FM 2154.

#### Walker County

6.5 N Huntsville 05 1705CST 0 0 5K Thunderstorm Wind  
Trees blown down and 3/4" hail.

#### Colorado County

Weimar 05 1710CST 0 0 3K Hail (0.75)

#### Colorado County

1 E Columbus 05 1715CST 0 0 3K Hail (0.75)

#### Colorado County

Weimar 05 1715CST 0 0 2K Thunderstorm Wind  
Trees blown down along FM 250.

#### Waller County

Waller 05 1725CST 0 0 5K Hail (1.50)

#### Harris County

4 NE Hockley 05 1730CST 0 0 10K Hail (1.75)  
Hail at intersection of U.S. 290 & FM 2920.

#### Wharton County

4 NW Louise 05 2125CST 0 0 10K Hail (2.00)

#### Wharton County

El Campo 05 2130CST 0 0 10K Hail (1.75)

## Storm Data and Unusual Weather Phenomena

June 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

### ADDITIONS/CORRECTIONS

#### TEXAS, Central Southeast

##### **Fort Bend County**

<b>Rosenberg</b>	<b>05</b>	<b>2146CST</b>	<b>0.2</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>35K</b>	<b>Tornado (F0)</b>
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Brief tornado touchdown at the Fort Bend County Fairgrounds. Moderate roof damage to structures along with signs and trees blown down.

##### **Brazoria County**

<b>4 E Rosharon</b>	<b>05</b>	<b>2245CST</b>			<b>0</b>	<b>0</b>	<b>5K</b>	<b>Thunderstorm Wind</b>
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Trees blown down and cars blown into ditches along HWY 288.

##### **Brazoria County**

<b>5 N West Columbia</b>	<b>05</b>	<b>2245CST</b>			<b>0</b>	<b>0</b>	<b>5K</b>	<b>Thunderstorm Wind</b>
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Trees blown down and cars blown into ditches along HWY 36.

##### **Galveston County**

<b>Jamaica Beach</b>	<b>05</b>	<b>2345CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>	<b>Hail (0.75)</b>
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# Storm Data and Unusual Weather Phenomena

July 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### ALASKA, Southeast

#### AKZ028

#### Dixon Entrance To Cape Decision-Coastal Area

15 0730AST 0 0 High Wind (G58)  
1700AST

Intense low pressure system moved north along the outer coast of Southeast Alaska. Strongest winds were over the Southern Panhandle. Hydaberg (PAHY) peak gust 58kt/67mph. Fishing vessel reported 60kt near Marsh Point in Cordova Bay. Rose Point (WRO) in Canadian portion of Dixon Entrance had 40-60kt. Structural damage to a trailer in Craig.

### COLORADO, West

#### La Plata County

##### Durango

08 1339MST 0 0 1K Lightning

Lightning struck a power substation and destroyed two insulators. This resulted in a power outage to about 250 business and homes for nearly 1.5 hours.

#### La Plata County

##### 7 SW Hesperus

08 1400MST 0 0 Heavy Rain  
1600MST

2.20 inches of rain fell within two hours.

#### La Plata County

##### Durango

08 1515MST 0 0 Flash Flood  
1530MST

30 cubic yards of mud and debris slid off Animas Mountain and onto Animas View Drive, closing the road until the mud and debris were removed.

#### Archuleta County

##### Pagosa Spgs

24 1330MST 0 0 12K Lightning  
1345MST

A flurry of lightning activity resulted in several small forest and grass fires near Pagosa Springs, as well as extensive damage to a radio station in Pagosa Springs. A house in Pagosa Springs also received minor damage after being struck by lightning. One lightning strike hit a broadcast communications tower and blew the metal grounding balls off of the base. Another nearby lightning strike occurred seconds later, striking a chain link fence which carried the current on a path to the electronics within the radio station. Among the items destroyed were the electronic weather instruments, computers, monitors, the satellite receiver system, and the telephone system.

#### Archuleta County

##### Pagosa Spgs

28 1400MST 0 0 0.50K Lightning

Lightning struck near a radio station. The current traveled into the radio station and destroyed a computer.

### TEXAS, Central Southeast

#### Madison County

##### Madisonville

17 1326CST 0 0 5K Tstm Wind/Hail

Hail (unknown size) and trees blown.

#### Walker County

##### 2 E Huntsville

17 1420CST 0 0 10K Hail (1.75)

Hail on HWY 190.

#### Polk County

##### 2 SW Moscow

17 1538CST 0 0 3K Hail (1.00)

#### Houston County

##### Kennard

17 1545CST 0 0 5K Thunderstorm Wind

Trees blown down in the Kennard and Lake Ratcliff areas.

#### San Jacinto County

##### Shepherd

17 1600CST 0 0 5K Thunderstorm Wind

Wind damage to homes in Shepherd.

#### Harris County

##### 5 SE Cypress

17 1715CST 0 0 3K Thunderstorm Wind

Wind damage to structures at FM 1960 & U.S. 290.

#### Harris County

##### Jersey Village

17 1727CST 0 0 40K Thunderstorm Wind

# Storm Data and Unusual Weather Phenomena

July 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

Apartment complex under construction blown down.

#### **Liberty County**

<b>1 N Daisetta</b>	<b>17</b>	<b>1730CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>		<b>Thunderstorm Wind</b>
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Trees down on HWY 834.

#### **Burleson County**

<b>Countywide</b>	<b>17</b>	<b>1731CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>		<b>Thunderstorm Wind</b>
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Trees blown down in SW parts of the county.

#### **Harris County**

<b>Houston</b>	<b>17</b>	<b>1735CST</b>			<b>0</b>	<b>0</b>	<b>15K</b>		<b>Thunderstorm Wind</b>
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Wind damage at the FOX Studios on U.S. 59 and also at the Compaq Center.

#### **Harris County**

<b>Baytown</b>	<b>17</b>	<b>1750CST</b>			<b>0</b>	<b>0</b>	<b>15K</b>		<b>Thunderstorm Wind</b>
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Trees blown down (one onto a roof).

#### **Chambers County**

<b>Wallisville</b>	<b>17</b>	<b>1810CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>		<b>Thunderstorm Wind</b>
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Trees blown down on Glenwood Rd.

#### **Brazoria County**

<b>Pearland</b>	<b>17</b>	<b>1835CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>		<b>Thunderstorm Wind</b>
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Large limbs blown down at HWY 35 & FM 518.

#### **Brazoria County**

<b>Pearland</b>	<b>17</b>	<b>1900CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>		<b>Hail (0.75)</b>
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#### **Fort Bend County**

<b>Missouri City</b>	<b>17</b>	<b>1900CST</b>			<b>0</b>	<b>0</b>	<b>5K</b>		<b>Hail (0.75)</b>
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3/4" hail and 60 mph winds at U.S. 90A & Gessner.

#### **Harris County**

<b>Houston</b>	<b>17</b>	<b>1900CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>		<b>Hail (0.75)</b>
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Hail at Post Oak & Braeswood.

#### **Harris County**

<b>Houston</b>	<b>17</b>	<b>1900CST</b>			<b>0</b>	<b>0</b>	<b>10K</b>		<b>Thunderstorm Wind</b>
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Trees down and structural damage to shopping center at Stells Link & Wood Valley.

#### **Harris County**

<b>Pasadena</b>	<b>17</b>	<b>1910CST</b>			<b>0</b>	<b>0</b>	<b>10K</b>		<b>Thunderstorm Wind</b>
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Powerlines and trees down in downtown Pasadena.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property		

August 1998

## ADDITIONS/CORRECTIONS

### AMERICAN SAMOA

ASZ001>004

Swains - Tutuila - Manu'A - Rose

01	0000SST	0	0	Drought
31	2359SST			

August was on the dry side again, it was one of the driest August since 1967 (in the top 4). Rainfall in August totalled 1.59 inches or 5.12 inches below the normal of 6.71 at WSO-Pago Pago. Brief relief from the drought came at the end of the month with a storm total of 1.04 inches on the 31st and September 1.

### INDIANA, Northeast

St. Joseph County

South Bend

25	0125EST	0	0	150K	Thunderstorm Wind
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THE DOORS WERE BLOWN OFF A SQUAD CAR. NUMEROUS TREES AND POWER LINES WERE DOWN ACROSS TOWN AND ESPECIALLY ACROSS THE EASTERN THIRD OF THE COUNTY. ONE TREE FELL ONTO A HOME ALONG AUTEN ROAD WHICH CAUSED MODERATE STRUCTURAL DAMAGE TO THE HOME.

Elkhart County

9 WNW Bristol to  
Bristol

25	0130EST 0135EST	9	100	0	0	200K	Tornado (F0)
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THIS WAS THE SAME TORNADO WHICH BEGAN IN NILES EARLIER. DAMAGE WAS EXTENSIVE TO TREES AND POWER LINES FROM THE ELKHART/CASS COUNTY LINE TO THE TOWN OF BRISTOL. SOME HOMES SUFFERED MAINLY MINOR DAMAGE TO SIDING...ROOFS AND GUTTERS. SOME OUTBUILDINGS HOWEVER WERE COMPLETELY DESTROYED.

Elkhart County

2 SSE Dunlap to  
2.5 SSE Dunlap

25	0135EST 0136EST	0.5	100	0	0	300K	Tornado (F1)
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THIS TORNADO LIKELY FORMED ALONG THE LEADING EDGE OF THE BOW ECHO WHICH PASSED THROUGH BERRIEN AND ST. JOSEPH COUNTIES EARLIER. IT TOUCHED DOWN ON TOP OF THE FORD DEALERSHIP ALONG HIGHWAY 33 TEARING OFF A LARGE PART OF THE ROOF AND ONE WALL. NEXT IT THREW A FORD AEROSTAR VAN INTO A POWER POLE AND PICKED UP AN RV TOSSING IT OVER 50 YARDS AWAY ACROSS THE HIGHWAY INTO A DITCH. NEXT IT CROSSED A STREET AND HIT A MANUFACTURED HOME DEALERSHIP SHIFTING SEVERAL HOMES OFF THEIR FOUNDATIONS, TEARING A LARGE PART OF THE OFFICE ROOF OFF AND FLIPPING A MOVING VAN OVER. IT THEN PROCEEDED DOWN ALONG HIGHWAY 33 FOR APPROXIMATELY ANOTHER 200 YARDS TEARING OFF PARTS OF ROOFS AND AIR CONDITIONING UNITS BEFORE LIFTING.

Elkhart County

Elkhart to  
Goshen

25	0135EST 0140EST			0	0	250K	Thunderstorm Wind
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EXTENSIVE TREE AND POWER LINE DAMAGE OCCURRED ACROSS THE ENTIRE COUNTY. SEVERAL BUILDINGS AND CARS IN DOWNTOWN GOSHEN SUSTAINED MINOR TO MODERATE STRUCTURAL DAMAGE DUE TO LARGE TREES AND LIMBS CRASHING DOWN. BUSINESSES ON THE EAST SIDE OF GOSHEN ALONG HIGHWAY 33 SUSTAINED DAMAGE. THE HOLIDAY INN HAD PART OF ITS ROOF BLOWN OFF. LOCAL BANK HAD ITS STEEL BANK SIGN FLATTENED.

### TEXAS, Central Southeast

Waller County

Brookshire

03	1720CST	0	0	30K	Thunderstorm Wind
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Trees and 35 powerlines blown down.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm	September 1998
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## ADDITIONS/CORRECTIONS

### ALABAMA, Southeast

#### ALZ065>069

#### Coffee - Dale - Henry - Geneva - Houston

02 2100EST 0 0 120K Tropical Storm  
03 1800EST

Tropical Storm Earl moved northeastward across Southwest and Central Georgia. Rainfall amounts varied from two to four inches. Peak wind gusts of 40 mph were recorded at Ozark and Enterprise, AL. Throughout Coffee, Dale, Henry, and Houston counties, numerous reports of minor damage caused by downed trees and power lines with scattered outages. Geneva County officials reported wind damage to a few businesses in Slocumb, AL. CR 28 was temporarily closed to fallen trees and power lines.

#### Coffee County

##### Elba

28 0000EST 0 0 2.5M 15M Flash Flood  
29 1800EST

Torrential rains of 8 to 24 inches produced the worst flash flooding in Geneva County since Hurricane Opal in 1995. Numerous roads were damaged or washed out. AL 54 was closed from Samson west to Florala. All county roads were closed for fear of more flooding and washouts. Significant losses were incurred to peanut and cotton crops. Several creeks overflowed their banks closing AL 65, 54, and 52.

#### Geneva County

##### Samson

28 0000EST 0 0 1.5M Flash Flood  
29 1800EST

Torrential rains produced considerable flash flooding of city and residential streets.

#### Coffee County

##### Northeast Portion

28 1420EST 0 0 50K Thunderstorm Wind  
1425EST

Numerous trees and power lines down on CR 306 and 307 near Brantley. One tree fell on a house.

#### Dale County

##### Ozark

28 1530EST 0.3 30 0 0 25K Tornado (F0)

An F0 tornado briefly touched down on the north side of Ozark off Marvin Parker Rd and CR 68 uprooting trees and power poles.

#### Henry County

##### Newville

28 2000EST 0.5 40 0 0 75K Tornado (F0)

An F0 tornado damaged a barn and residence off CR 173 in Newville.

#### Dale County

##### Echo

28 2035EST 0.3 40 0 0 150K Tornado (F0)

An F0 tornado briefly touched down at the intersection of CR 40 and 7 near the Dale-Henry County line.

Numerous trees were uprooted and a pump house was destroyed.

#### Geneva County

##### Samson

29 0230EST 1 60 0 3 100K Tornado (F1)

An F1 tornado touched down five miles northeast of Samson off CR 8. One mobile was lifted 50 feet off its foundation and destroyed. The three occupants sustained minor injuries.

#### Coffee County

##### Enterprise

29 0240EST 1 75 0 0 1.5M Tornado (F1)

An F1 tornado touched down on CR 725 near Enterprise. One residence suffered roof damage. Camp Wiregrass sustained moderate to severe damage with several buildings crumpled, trees and power lines down, and scattered debris. Numerous customers in Enterprise were without electric service. A semi was blown over at Con Agra.

#### Coffee County

##### New Brockton

29 0245EST 1 50 0 0 500K Tornado (F1)

An F1 tornado descended near CR 732 in New Brockton damaging several chicken houses, roads, ditches, and drainage systems.

#### Geneva County

##### Geneva

29 0245EST 3 50 0 0 50K Tornado (F1)  
0250EST

A tornado touched down in central Geneva County. It skipped along AL Highway 85 between Geneva and Bellwood. Several trees and power lines were toppled. The Providence Church near Bellwood sustained roof damage from fallen trees.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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September 1998

## ADDITIONS/CORRECTIONS

### AMERICAN SAMOA

ASZ002

Tutuila

25 1600ST  
26 0900ST

0 0

Flood

Heavy storms brought floods to several villages island wide, especially homes near stream. A large number of underground water wells were shut down because of high salt content, but two desalination machines--to make the water drinkable--have been acquired with support from the federal government in Washington. The rainfall recorded for this month was 4.30 in. at WSO-Pago Pago, where the normal for September is 6.61 in.

### COLORADO, South Central and Southeast

Prowers County

36 S Lamar

23 1500MST

1 3

Lightning

Terry Hendricks, 32, died and three others were injured while working at a hog farm when lightning struck. Hendricks was carrying a metal object when the lightning struck and died at the scene. The other three men were airlifted to a Denver area hospital for burns and residual tingling sensation. M32OU

### FLORIDA, Northwest

FLZ008>019-  
026>029-034

Coastal Walton - Holmes - Washington - Jackson - Bay - Calhoun - Gulf - Franklin - Gadsden - Leon -  
Jefferson - Madison - Liberty - Wakulla - Taylor - Lafayette - Dixie

02 1200EST  
03 1800EST

2 2 6.0M

Hurricane

Hurricane Earl, a minimal Category 1 storm, came ashore near Panama City, FL early Thursday, September 3, 1998. Earl weakened to a tropical storm as it tracked northeastward through Central Georgia. Two-day rainfall totals ranged from 12.46 inches at Panama City, FL to 4.27 inches at Cross City, FL. The peak 10-minute wind recorded at the Cape San Blas C-MAN buoy was 48 knots with a peak gust of 61 knots. The lowest sea-level pressure recorded was 987 mb at the Panama City-Bay City International Airport. The storm surge along the Florida Big Bend coast ranged from 6 to 12 feet above normal tide levels. Significant beach erosion occurred along Coastal Walton County as well as Carrabelle Beach and Alligator Point. Bay County experienced the worst urban and small stream flooding since Hurricane Opal in 1995. Flooding occurred along the St. Marks River at Newport, FL where a crest of eight feet was measured. Two fishermen died when their boat capsized in 16 to 20 foot seas offshore of Panama City Beach, FL. Two persons were injured, one each in Walton and Jackson Counties. Bay, Gulf, Franklin, Wakulla, Taylor, and Dixie counties were declared federal disaster areas.

In Bay County, fresh water flooding damaged 1,049 homes, three businesses, and 50 other structures. Three homes were destroyed. The Gulf Highlands subdivision in Panama City Beach suffered the worst flooding with up to five feet of water inside homes. The Edgewater Beach Resort and Glades subdivision also sustained severe flooding. Power outages affected 7,100 residents. Other Bay County municipalities reported minor flood damage and numerous trees down. Several roads, including FL 77, were temporarily closed until flood waters receded. Holmes and Jackson counties reported several county roads washed out, numerous downed trees and power lines, and minor damage to three homes. A few county roads were closed to flooding and downed trees in Walton and Washington counties. Erosion caused by heavy flooding damaged two roads in Liberty County. Localized flooding with some downed trees and power lines occurred in Leon and Gadsden counties. Throughout Madison, Lafayette, and Jefferson counties, there was minor damage from downed trees and power lines as well as some secondary roads closed to flooding. Strong winds and flooding damaged one home, a state park, and closed 10 county roads in Calhoun County. Across Gulf County, strong winds and flooding damaged 300 homes and disrupted power for 8,700 customers. At Port St. Joe, storm surge flooding damaged 14 businesses and caused a water main break at the Lighthouse Utilities facility. In Franklin County, storm surge flooding affected 136 homes and 15 businesses. FL 65, 98, 300, and the St. George Causeway were closed to high water. Alligator Point Road washed out stranding 50 people at Alligator Point. Throughout Wakulla County, high winds and coastal flooding damaged 216 homes and businesses. Significant wind and flood damage was reported at Live Oak Island, Spring Creek, Ochlocknee, Oyster Bay, Panacea, Medart, Sopchoppy, and St. Marks. Power was disrupted for 1,000 customers and the St. Marks Wastewater facility. Taylor County officials reported severe coastal flooding at Dekle and Keaton Beach with moderate flood damage to nine other coastal communities. A total of 55 single-family units, six residences, and five businesses were affected. CR 361 closed and water four feet deep over roads near the Econfina River. In Dixie County, coastal flooding destroyed five homes and damaged 39 others. Severe flooding occurred in the town of Suwannee and 50 pumps were destroyed at the Suwannee Wastewater Treatment facility. CR 351 at Horseshoe Beach was washed out.

M68BO, M34BO

Franklin County

East Pt

02 2130EST

1

55

0

0

150K

Tornado (F1)

Six homes suffered moderate to severe damage as an F1 tornado swept across St. George Island.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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September 1998

## ADDITIONS/CORRECTIONS

### FLORIDA, Northwest

#### Walton County

**De Funiak Spgs**      **28**      **0845EST**      **0.5**      **45**      **0**      **0**      **50K**      **Tornado (F0)**

A tornado touched down near the Valley View subdivision along FL 183 about four miles northeast of De Funiak Springs. The tornado lifted the roof of a residence and neighboring shed, and pulverized a pump house. Debris was strewn across the highway and over adjacent timberland.

#### Bay County

**Bid A Wee**      **28**      **1245EST**      **2**      **60**      **0**      **0**      **250K**      **Tornado (F1)**

An F1 tornado struck the Bid-A-Wee subdivision west of Panama City. The tornado damaged 23 homes surrounding the Surfside Middle School.

#### Bay County

**Westbay**      **29**      **0915EST**      **3**      **70**      **0**      **1**      **125K**      **Tornado (F1)**

An F1 tornado touched down in West Bay. The tornado damaged the West Bay Holiness Community Church off CR 388. The church's roof was lifted off and its steeple toppled. The tornado skipped northward across FL 79 and Vinson Rd, north of the Woodville subdivision where several large trees were uprooted. A woman was injured by flying glass when the tornado demolished the roof of her home and blew in a window and glass door.

#### Madison County

**Hopewell**      **29**      **1900EST**      **0.5**      **35**      **0**      **0**      **25K**      **Tornado (F0)**

A convenient store received minor damage and several trees were uprooted when a F0 tornado briefly touched down at the intersection of FL 360 and Interstate 10.

#### Dixie County

**Fletcher**      **30**      **0600EST**      **1**      **40**      **0**      **0**      **100K**      **Tornado (F0)**

An F0 tornado destroyed two mobile homes and uprooted several trees 10 miles north of Old Town.

**FLZ007>019-026-028>029-034**

**Inland Walton - Coastal Walton - Holmes - Washington - Jackson - Bay - Calhoun - Gulf - Franklin - Gadsden - Leon - Jefferson - Madison - Liberty - Taylor - Lafayette - Dixie**

**28**      **0000EST**      **0**      **1**      **62.0M**      **Hurricane**  
**30**      **1200EST**

Hurricane Georges, a Category 2 storm, made landfall near Biloxi, MS early Monday, September 28, 1998. A peak wind gust of 52 knots was measured at the Gulf of Mexico data buoy 85 nautical miles south of Panama City. Georges produced storm surges of 6 to 12 feet along the Florida Panhandle coast and 3 to 5 feet along the Big Bend coast. Torrential rainfall amounts of 12 to 24 inches were common over Southeast Alabama and the Florida Panhandle with 5 to 10 inches over Southwest Georgia and the Big Bend. These rains swelled area rivers, creeks, and streams well above flood stage. Eight people were injured as numerous tornadoes were spawned by the remnants of Tropical Depression Georges across Southeast Alabama, Southwest Georgia, and Northwest Florida. Georges pushed 1998 agricultural losses in Georgia over \$800 million. Beach erosion along the Panhandle coast was moderate to severe. Bay County experienced its worst beach erosion since Hurricane Eloise in 1975. Liberty, Calhoun, Bay, Holmes, Washington, Gadsden, Walton, Gulf, Franklin, Jackson, Wakulla, Coffee, and Geneva counties were declared federal disaster areas.

As a result of the runoff from Georges' torrential rains, the following area rivers were affected:

Apalachicola at Blountstown, FL (FS 15 ft), crest 18.9 ft (10/2/98)  
Aucilla at Lamont, FL (FS 9 ft), crest 13.9 ft (10/3/98)  
Chipola at Altha, FL (FS 22 ft), crest 22.9 ft (10/2/98)  
Choctawhatchee at Newton, AL (FS 19 ft), crest 21.6 ft (10/1/98)  
Choctawhatchee at Geneva, AL (FS 23 ft), crest 32 ft (10/1/98)  
Choctawhatchee at Caryville, FL (FS 12 ft), crest 17.7 ft (10/2/98)  
Ochlockonee at Thomasville, GA (FS 15 ft), crest 18.6 ft (10/2/98)  
Ochlockonee at Havana, FL (FS 25 ft), crest 28.8 ft (10/3/98)  
Ochlockonee at Bloxham, FL (FS 22 ft), crest 22.0 ft (10/2/98)  
Pea at Elba, AL (FS 30 ft), crest 33.9 ft (9/30/98)  
St. Marks at Newport, FL (FS 7 ft), crest 9.5 ft (10/3/98)  
Withlacoochee at Valdosta, GA (FS 13 ft), crest 15.2 ft (10/2/98)

Large battering waves undermined piers and walkways along Front Beach Rd in Panama City Beach. At Carralon Beach, a portion of seawall breached forcing a five-foot wall of water collapsed the first floor of the Pinnacle Port Resort meeting room. Strong winds blew metal awnings off several businesses and storm surge flooding washed out portions of Front Beach and Thomas Rds in Panama City Beach. Calhoun County officials reported 15 to 20 homes surrounded by high water and severe erosion to numerous unpaved county roads. Across Coastal and Inland Walton County, storm surges of 10 to 12 feet above tide levels caused extensive beach erosion and undermined numerous coastal structures. Considerable coastal flooding damaged several homes and businesses.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage (Property)		

September 1998

## ADDITIONS/CORRECTIONS

### FLORIDA, Northwest

132 roads were closed including Interstate 10 from Mossy Head to Crestview. Five people stranded on the Shoal River Bridge near CR 1087 were rescued by boat. An earthen dam at Kings Lake threatened to breach and 100 residents were evacuated. The Alaque Creek overflowed its banks and flooded homes from Portland to Freeport. Dixie County experienced minor coastal flooding with many county roads and residences flooded. Franklin County reported FL 30 and U.S. 98 closed to flooding and erosion from Carrabelle Park to 4th St in Eastpoint. A few roads were closed to flooding, scattered trees and power lines down, and six homes damaged in Gadsden County. Gulf County officials reported numerous roads closed and flooding of some homes and businesses. In Holmes County, 30 roads flooded and 20 bridges washed out. An emergency evacuation of 300 residents along creeks between FL 77 and 79. Severe damage to Caryville campsites along the Choctawhatchee River. The Purdue Farms was damaged by flooding killing 48,000 chickens. Jackson County reported several trees down, some onto power lines in the Woodrest community. Flood waters closed FL 2 in Campbellton and 15 other county roads. Across Jefferson County, numerous county roads experienced flood damage with 13 closed. A few roads were closed to flooding, and isolated tree and power line damage occurred throughout Lafayette County. Leon County officials reported some urban and small stream flooding as well as scattered reports of downed trees and power lines. FL 20 was closed from Tallahassee west to the Liberty-Leon County line. 1,800 customers in Northeast Tallahassee lost power when a large tree fell onto a utility line. Liberty County experienced flooding of seven homes and one business. Several county roads were damaged by erosion and numerous others affected by high water. Taylor County reported some minor coastal flooding and a few roads closed to high water. High winds downed several large trees onto utility lines one mile west of Crawfordville and minor coastal flooding was observed in Wakulla County. Flooding damaged nine roads and forced the evacuation of residents along the Choctawhatchee River at Caryville in Washington County.

#### Walton County

##### Countywide

29	0600EST 1200EST	0	0	500K	Flash Flood
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Choctawhatchee Bay water levels high and county creeks have overflowed their banks. Several homes along creek beds sustained some flood damage in the Freeport, Rock Hill, and Portland.

#### Holmes County

##### Countywide

29	0800EST 1400EST	0	0	1.3M	Flash Flood
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Widespread flash flooding of numerous county dirt roads as well as FL 90, CR 81, and CR 179.

#### Washington County

##### Countywide

29	0800EST 1400EST	0	0	750K	Flash Flood
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Flash flooding closed 13 county roads. FL DOT closed Highways 277, 279, and 79.

### GEORGIA, Southwest

GAZ121-124>125-  
127-129>131-  
142>143-145-148-  
155>157-159>161

**Clay - Terrell - Dougherty - Worth - Tift - Ben Hill - Irwin - Early - Miller - Mitchell - Berrien - Seminole - Decatur - Grady - Brooks - Lowndes - Lanier**

03	0000EST	0	0	650K	Tropical Storm
04	1200EST				

Tropical Storm Earl produced widespread moderate to heavy rain and strong winds as it trekked northeast from Southwest to East-central Georgia. Rainfall totals associated with Earl ranged from three to six inches. Peak wind gusts of 40 to 50 mph were common.

Ben Hill County officials reported several county roads closed due to high water, flooding of low-lying areas, and sporadic power outages. Berrien, Irwin, and Worth counties sustained minor flooding, downed trees and power lines. In Clay County, GA 37 and 39 were closed to high water and scattered debris. Several downed trees and power lines reported in Fort Gaines. Across Brooks, Grady, Miller, Tift, and Seminole counties, several county roads were closed to high water, downed trees and power lines. Dougherty County officials estimated 100 families were displaced to area shelters due to widespread flooding in Albany. GA 97 and 256 were closed to flooding and debris in Decatur County. Throughout Lanier County, numerous trees and power lines were down with roof damage to several residences. U.S. 27 south of Blakely and GA 45 from Arlington to Colquitt were closed to flooding. In Lowndes County, numerous trees littered roadways and some fell onto homes and vehicles. Scattered power outages affected 7,000 customers. In Mitchell County, a large tree fell onto a power line disrupting service to 3,400 customers. Terrell County officials reported several downed trees and power lines. A few homes sustained light to moderate damage from fallen trees. The Kinchafoonee Creek at Dawson, where the flood stage is 13 feet, crested at 13.6 feet on September 5.

#### Mitchell County

##### Camilla

29	0505EST 0515EST	3	60	0	1	500K	Tornado (F1)
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# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm	September 1998
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## ADDITIONS/CORRECTIONS

### GEORGIA, Southwest

An F1 tornado struck Camilla on Mt. Zion Rd and GA 37 uprooting large pines, damaging a residence and farm machinery, and destroying a shed. A man was injured when his pickup truck was blown off GA 262. The tornado toppled numerous pecan trees as it travelled north of Camilla along U.S. 19.

#### Thomas County

**Coolidge**      29      1440EST      1.2      65      0      0      450K      **Tornado (F1)**

An F1 tornado touched down off Bayline Rd near Coolidge which uprooted trees and utility poles, damaged a camper and brick house, and destroyed the Patch Poultry Farm and its 45,000 chickens.

#### Worth County

**Central Portion**      29      1510EST  
1530EST      0      0      350K      **Thunderstorm Wind**

Thunderstorms winds damaged several residences across Central Worth County. Numerous power outages as trees fell onto utility lines at Liberty Hill, Anderson City, Sylvester, Spring Flats Rd, Sumner, Ty Ty, Massey Airport Rd, and Gordy. In Anderson City, a barn was destroyed on Brooks Rd and a mobile home was blown off its foundation on Evergreen Rd. High winds overturned a school bus on GA 33 one mile south of Sylvester.

#### Colquitt County

**Autreyville**      29      1515EST      2      70      0      1      550K      **Tornado (F1)**

An F1 tornado touched down at the intersection of GA 133 and South Morris Rd near Autreyville. One man was injured when his mobile home was blown into a ditch. Another mobile was destroyed. Several trees and power lines were toppled. The tornado destroyed one chicken farm and damaged another, and caused minor roof damage to a few houses.

#### Worth County

**Isabella**      29      1600EST      1.7      85      0      0      300K      **Tornado (F1)**

An F1 tornado briefly touched down on GA 520 between Poulan and Ty Ty. It skipped over and descended on the 850-acre Boy Scout Camp Osborn outside Isabella causing extensive damage to the dining hall and pool facilities. The tornado uprooted more than 1,000 trees.

#### Decatur County

**Bainbridge**      29      1730EST      0.6      40      0      0      50K      **Tornado (F0)**

A brief F0 tornado touchdown just south of Bainbridge on GA 97. Some trees and power lines down.

#### Miller County

**Southwest Portion**      29      1905EST      0      0      250K      **Thunderstorm Wind**

Thunderstorm winds severely damaged the United Primitive Baptist Church and cemetery eight miles southwest of Colquitt.

#### Miller County

**12 E Colquitt**      29      1930EST      2      75      0      2      750K      **Tornado (F1)**

A strong F1 tornado destroyed a doublewide trailer off Cooktown Rd about 12 miles east of Colquitt. Two of the three occupants were critically injured. The tornado moved north and struck a neighboring farm and ripped roofs off outbuildings, twisted sheet metal, and destroyed a grain bin and farm equipment.

#### Randolph County

**2 E Cuthbert**      29      1300EST      0.5      70      0      1      500K      **Tornado (F1)**

Tornado touched down two miles east of Cuthbert off U.S. 82 bypass. A manufacturing plant was destroyed where one employee was injured by falling debris. Several large pine trees were uprooted.

### OKLAHOMA, Western, Central and Southeast

#### Kay County

**1.5 SW Blackwell**      21      1017CST      0      0      10K      **Thunderstorm Wind**

#### Kay County

**Blackwell**      21      1020CST      0      0      **Thunderstorm Wind (G52)**

#### Blaine County

**Okeene**      21      1450CST      0      0      **Hail (0.75)**

#### Major County

**5 S Isabella**      21      1450CST      0      0      **Hail (0.75)**

#### Major County

**4 SE Ames**      21      1504CST      0      0      **Thunderstorm Wind (G61)**

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage Property	Crops	Character of Storm
					Killed	Injured			

September 1998

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Major County

3 SE Ames 21 1510CST 0 0 Hail (1.00)

#### Garfield County

Enid 21 1515CST 0 0 1K Lightning

#### Garfield County

3 S Waukomis to 21 1540CST 1 100 0 0 35K Tornado (F1)  
3 SE Waukomis 1542CST

#### Garfield County

Bison 21 1545CST 0 0 0.01K Thunderstorm Wind

#### Garfield County

2 SE Bison 21 1550CST 0 0 Thunderstorm Wind (G87)

#### Dewey County

Seiling 21 1610CST 0 0 0.01K Thunderstorm Wind

#### Kingfisher County

12 E Hennessey 21 1610CST 0 0 0.20K Thunderstorm Wind

#### Logan County

3 SW Marshall 21 1610CST 0 0 0.01K Thunderstorm Wind

#### Garfield County

6 S Covington 21 1615CST 0 0 Hail (0.88)

#### Logan County

3 SE Marshall 21 1620CST 0 0 Thunderstorm Wind (G57)  
1630CST

#### Logan County

9 N Crescent to 21 1625CST 1.5 50 0 0 1K Tornado (F0)  
8 W Mulhall 1627CST

#### Major County

5 SE Chester 21 1625CST 0 0 Hail (0.75)

#### Kay County

Blackwell 21 1630CST 0 0 Hail (1.00)

#### Kingfisher County

7 NE Hennessey 21 1634CST 0 0 Hail (1.00)

#### Logan County

7 W Marshall 21 1634CST 0 0 Hail (1.00)

#### Kay County

Blackwell 21 1635CST 0 0 Hail (1.75)  
1645CST

#### Blaine County

2 W Canton 21 1645CST 0.5 50 0 0 3K Tornado (F0)

#### Dewey County

9 E Hucmac 21 1645CST 0.5 50 0 0 3K Tornado (F0)

#### Blaine County

Eagle City 21 1650CST 0 0 60K Lightning

#### Logan County

Mulhall 21 1650CST 0 0 Hail (2.75)

#### Blaine County

5 E Canton 21 1700CST 0 0 Thunderstorm Wind (G52)

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage Property	Crops	Character of Storm
					Killed	Injured			

September 1998

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Logan County

3 SW Langston 21 1710CST 0 0 4K Thunderstorm Wind (G69)

#### Major County

Ringwood 21 1710CST 0 0 Thunderstorm Wind (G52)

#### Alfalfa County

Aline 21 1715CST 0 0 Hail (0.75)

#### Payne County

3 NW Perkins 21 1715CST 0 0 Hail (0.75)

#### Payne County

3 NW Perkins 21 1715CST 0 0 Hail (0.75)

#### Blaine County

1 E Canton 21 1730CST 0 0 Hail (0.75)

#### Lincoln County

6 N Carney 21 1733CST 0 0 Hail (1.00)

#### Lincoln County

5 NW Tryon 21 1740CST 0 0 Hail (1.00)

#### Kingfisher County

3 W Loyal 21 1745CST 0 0 Thunderstorm Wind (G52)

#### Kingfisher County

Loyal 21 1745CST 0 0 6.5K Thunderstorm Wind

#### Lincoln County

3 W Tryon 21 1750CST 0 0 Hail (1.75)

#### Kingfisher County

1 N Loyal 21 1800CST 0 0 2K Thunderstorm Wind

#### Kingfisher County

Kingfisher 21 1805CST 0 0 5K Thunderstorm Wind

#### Lincoln County

7 N Chandler 21 1805CST 0 0 Hail (1.75)

#### Kay County

5 NW Braman 21 1823CST 0 0 Thunderstorm Wind (G52)

#### Kay County

4 N Braman 21 1825CST 0 0 Thunderstorm Wind (G52)

#### Logan County

4 SW Guthrie 21 1900CST  
1905CST 0 0 Thunderstorm Wind (G69)

#### Logan County

10 SW Guthrie to 21 1900CST  
8 SE Guthrie 1920CST 0 5 3.5M Thunderstorm Wind

#### Logan County

Guthrie 21 1915CST 0 0 0.50K Lightning

#### Logan County

5 SW Seward 21 1925CST 0 0 Hail (1.75)

#### Oklahoma County

3 N Arcadia 21 1925CST 0 0 Thunderstorm Wind (G61)

#### Oklahoma County

5 NE Edmond 21 1925CST 0 0 Hail (1.75)

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage Property	Crops	Character of Storm
					Killed	Injured			

September 1998

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Oklahoma County

5 NE Edmond 21 1925CST 0 0 Thunderstorm Wind (G61)

#### Oklahoma County

Jones to 21 1925CST 1 10 2M Thunderstorm Wind  
2 NE Harrah 1950CST  
M2MH

#### Oklahoma County

2 W Arcadia 21 1930CST 0 0 Hail (1.00)

#### Oklahoma County

Oklahoma City 21 1935CST 0 0 200K Lightning

#### Oklahoma County

2 NE Spencer 21 1940CST 0 0 Thunderstorm Wind (G52)  
Measured by Oklahoma Mesonet.

#### Oklahoma County

Edmond 21 1945CST 0 0 20K Thunderstorm Wind

#### Lincoln County

3 NW Midway to 21 1950CST 0 0 20K Thunderstorm Wind  
2 NW Midway 1955CST

#### Oklahoma County

Oklahoma City 21 1950CST 0 0 Thunderstorm Wind (G52)

#### Lincoln County

Chandler 21 2000CST 0 0 3K Lightning

#### Payne County

Cushing 21 2000CST 0 0 0.10K Thunderstorm Wind (G64)

#### Cleveland County

4 W Moore 21 2020CST 0 0 1.5K Thunderstorm Wind

#### Cleveland County

Norman 21 2020CST 0 0 1K Thunderstorm Wind (G52)

#### Cleveland County

Slaughterville 21 2020CST 0 0 0.50K Lightning

#### Oklahoma County

Tinker Afb 21 2020CST 0 0 Thunderstorm Wind (G68)

#### Pottawatomie County

Shawnee 21 2031CST 0 3 35K Thunderstorm Wind

#### Garvin County

8 E Pauls Valley 21 2140CST 0 0 22K Thunderstorm Wind

#### Seminole County

Wewoka 21 2150CST 0 0 2K Thunderstorm Wind

#### Hughes County

Holdenville 21 2155CST 0 0 2K Thunderstorm Wind

#### Murray County

Sulphur 21 2255CST 0 0 9K Lightning

Severe thunderstorms developed over much of western and central Oklahoma from late morning through late evening of the 21st, and were responsible for 1 fatality and 18 injuries. Three tornadoes were also sighted. Storms first developed in Kay County during the late morning where a semi-truck was blown over 1.5 miles southwest of Blackwell near the intersection of Highway 11 and Interstate 35. Severe thunderstorms then redeveloped over Major and Blaine Counties a few hours later. As these storms moved east into Garfield County, a tornado was spotted 3 miles south of Waukomis moving east. This tornado, rated an F1, knocked down or snapped 40 to 50 power poles, damaged several outbuildings, and destroyed numerous trees. One large diesel storage tank was picked up and desposited one-half mile away. A pickup truck containing 2 occupants was also picked up a short distance from the

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1998	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops		

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

road and dropped on the side of the road near a creek. Both occupants were uninjured. A semi-trailer was also blown off the highway. As the tornado dissipated, severe thunderstorm winds blew down large tree limbs in Bison, and lightning from the same complex of thunderstorms struck a house in Enid, causing a short in the wiring, which then started a small house fire. Large tree limbs were also downed in Seiling in Dewey County, while a rain gutter from a house was ripped off by the winds 12 miles east of Hennessey in Kingfisher County breaking several flower pots. Large tree limbs were also downed in the same location.

As the thunderstorms moved into Logan County, Oklahoma Mesonet measured wind gusts of 59 mph and 66 mph at 1620 CST and 1630 CST respectively 3 miles southeast of Marshall. A weak, F0 tornado was then spotted 9 miles north of Crescent, just west of State Highway 74. The tornado uprooted several trees while crossing the highway, then quickly dissipated. Another weak tornado, an F0, was spotted on the Blaine/Dewey County border 2 miles west of Canton, knocking down trees and power poles. The same thunderstorm was responsible for a lightning strike at the Old Christian Church in Eagle City in Blaine County causing a fire that destroyed the church. As these storms moved east, thunderstorm winds damaged a fence, silo, and several trees in Logan County 3 miles southwest of Langston. Several power poles were blown down 1 mile north of Loyal in Kingfisher County, while in the city of Loyal 13 power poles were snapped, and large tree limbs were blown down. Widespread wind damage occurred in the city of Kingfisher consisting of downed trees and power lines over a 12 square block area on the northwest side of the city. The garage of a house also shifted causing roof damage.

Oklahoma Mesonet measured wind gusts of 63 mph and 80 mph at 1900 CST and 1905 CST respectively 4 miles southwest of Guthrie in Logan County. Straight-line winds then produced a large swath of damage to mobile homes, house roofs, trees, power poles and power lines in a 4 by 6 mile area across southern Logan County bounded by Western Ave to the west, Interstate 35 to the east, Forest Hills Road to the north, and Waterloo Road to the south. The worst damage occurred in a 1/2 by 1 1/2 mile area near Oak Cliff. Two-hundred fifty residents were damaged. Of these, 10 homes and business building were destroyed, while 41 structures suffered major damage. One hundred sixty-one single family homes, 43 mobile homes, 7 businesses, and 1 apartment complex suffered minor structural damage. Total damage estimates were near 3.5 million dollars. Five persons were injured, consisting mostly of broken fingers and cuts. No one was seriously injured. Lightning also struck an oil tank at Pine and Industrial in Guthrie, starting a fire that was quickly extinguished.

Unusually strong straight-line winds also left a swath of damage roughly 8 miles long and 2 miles wide from just east of Jones in eastern Oklahoma County, east-southeast into extreme western Lincoln County 3 miles northeast of Harrah. A two year-old boy was killed, and ten persons were injured, 8 of which were transported to local hospitals. Damage was estimated at about 2 million dollars. Damage was intermittent from east of Jones to north of Horseshoe Lake and was limited mainly to fallen tree limbs. A more persistent area of wind damage about 1.5 miles wide was found from near Luther Road and Wilshire southeast to near the county line and Northeast 50th. Widespread tree damage occurred in this area along with structural damage to several homes. By far the most concentrated area of damage was along a half-mile wide swath from Harrah Road and 63rd extending east-southeast. Several mobile homes were completely destroyed in this area, one of which disintegrated with the frame left wrapped around a tree. All of the destroyed mobile homes were perpendicular to the wind or nearly so and thus were hit broadside by the full force of the wind. The level of damage in this swath is estimated at strong F1 suggesting that maximum winds probably were between 100 and 110 mph.

Damage in Lincoln County consisted of downed power lines, uprooted trees, and damaged outbuildings in a half-mile wide by one-mile long swath just north of Highway 62. One barn also disintegrated as it was picked up by the wind and carried nearly one-quarter of a mile. In total, 75 homes were damaged; 11 suffered major damage, and six (All mobile homes) were destroyed. Three mobile homes were found to be totally disintegrated and one other that was rolled from its foundation. Several eyewitness reports indicated that at least some of these mobile homes were airborne while or just before they were destroyed. The fatality, and most of the injuries, were residents who were in the destroyed mobile homes when the winds struck. The last report of damage in Lincoln County occurred in Chandler, where lightning struck numerous transformers and power poles, knocking out power to all of Chandler for 5 hours.

Severe thunderstorm winds also downed trees, wires, and numerous power poles all across the city of Edmond in Oklahoma County. Seven thousand residents were left without power for several hours. One tree fell on a car, and the canopy was blown off at Juffy Lube on 2nd Street, east of Bryant. Farther south and east, a tree was blown down near the Mazzio's Pizza on State Highway in Cushing in Payne County; highway signs and numerous trees were downed near Highway 44 in Cleveland County 4 miles west of Moore, and trees and power lines were blown down in Norman, also in Cleveland County. Lightning struck an oil tank battery in Slaughterville in Cleveland County, causing a fire that burned for about 1 hour before being extinguished. A mobile home was blown off its foundation and destroyed in Shawnee in Pottawatomie County. Five persons were inside the home including 3 children who were injured from minor cuts and bruises. The roof was also blown off of a boathouse at Shawnee Lake, also in Pottawatomie County. Numerous Numerous power lines were downed 8 miles east of Pauls Valley in Garvin County knocking out power to 500 residents, while a house sustained significant roof damage from strong winds. Rain poured into the house causing an estimated \$20,000 in damage. Power lines and large tree limbs were downed in Wewoka in Seminole County and Holdenville in Hughes County. Lastly, Lightning struck a tree in Sulphur in Murray County, killing 3 cows and an angus bull standing under it.

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### ILLINOIS, Northwest

#### **Bureau County**

Countywide	17	1548CST			0	0			Flash Flood
	18	0100CST							

#### **Henderson County**

Countywide	17	1548CST			0	0			Flash Flood
	18	0100CST							

#### **Henry County**

Countywide	17	1548CST			0	0			Flash Flood
	18	0100CST							

#### **Mercer County**

Countywide	17	1548CST			0	0			Flash Flood
	18	0100CST							

#### **Rock Island County**

Countywide	17	1548CST			0	0			Flash Flood
	18	0100CST							

#### **Whiteside County**

Countywide	17	1548CST			0	0			Flash Flood
	18	0100CST							

Rain developed over Northern Missouri during the early morning hours and spread northward dumping two to four inches of rain across much of Eastern Iowa and Northwest Illinois by late afternoon. An additional one-half to two inches of rainfall during the evening sent several creeks...rivers and streams to near or slightly above bankfull. Heavy rain in parts of Rock Island County knocked out power and filled back yards and farm fields full of water. At southwest Rock Island's Lake View Estates at least 100 persons were stranded after rapidly rising water submerged the access roads. In Henry County the Green River at Geneseo rose seven feet. The Rock River in Illinois went up several feet bringing the river near flood stage in several communities. High water forced the closing of U.S. highway 150 near Coal Valley and shut down several access roads at the Quad City Airport hampering airport operations. Flooding was also reported near Keithsburg and Aledo. A number of minor automobile accidents occurred throughout the area...but no serious injuries were reported. Storm total rainfall amounts ranged from two to just over six inches in Eastern Iowa and West Central Illinois. In Illinois a few specific rainfall totals included; Orion 5.85 inches, Sheffield 4.61 inches, Geneseo 4.60 inches, Keithsburg 4.10 inches, Moline 4.05 inches, and Aledo and Port Byron 4.00 inches.

### IOWA, East Central and Southeast

#### **Benton County**

Countywide	17	1548CST			0	0			Flash Flood
		2150CST							

#### **Des Moines County**

Countywide	17	1548CST			0	0			Flash Flood
		2150CST							

#### **Henry County**

Countywide	17	1548CST			0	0			Flash Flood
		2150CST							

#### **Iowa County**

Countywide	17	1548CST			0	0			Flash Flood
		2150CST							

#### **Johnson County**

Countywide	17	1548CST			0	0			Flash Flood
		2150CST							

#### **Keokuk County**

Countywide	17	1548CST			0	0			Flash Flood
		2150CST							

#### **Lee County**

Countywide	17	1548CST			0	0			Flash Flood
		2150CST							

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### IOWA, East Central and Southeast

#### Louisa County

Countywide	17	1548CST 2150CST			0	0			Flash Flood
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#### Muscatine County

Countywide	17	1548CST 2150CST			0	0			Flash Flood
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#### Scott County

Countywide	17	1548CST 2150CST			0	0			Flash Flood
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#### Washington County

Countywide	17	1548CST 2150CST			0	0			Flash Flood
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Rain developed over Northern Missouri and spread across Iowa and Illinois with two to four inches of rain falling across much of Eastern Iowa and Northwest Illinois by late afternoon. Additional rainfall of one-half to two inches during the evening sent several creeks...rivers and streams to near or slightly above bankfull. Duck Creek was sent over it's banks flooding the bike path in several areas of Davenport. The Skunk River near Augusta, the Wapsipinicon River near DeWitt and the Maquoketa River at Maquoketa all rose several feet. The heavy rain was responsible for cancellations of the state marching band competition at Muscatine High School and the Danville High School Homecoming dance. In Danville, two computer rooms and parts of the multi-purpose room at Danville High were also flooded. Flooding closed one lane of U.S. 61 south of Fort Madison, and Iowa highway 16 west of U.S. 218. A number of minor automobile accidents occurred throughout the area...but no serious injuries were reported. Storm total rainfall amounts ranged from two to just over six inches. Specific rainfall totals included; Central Davenport 6.15 inches, Calamus and West Branch 3.60 inches, Iowa City 3.56 inches, and Muscatine and North Liberty 3.50 inches.

### OKLAHOMA, Western, Central and Southeast

#### Caddo County

6 ENE Lookeba	01	2005CST			0	0			Hail (0.88)
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#### Garfield County

Enid	02	0100CST			0	0	6K		Lightning
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#### McClain County

3 S Blanchard	02	0330CST			0	0	2K		Thunderstorm Wind
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#### Kay County

Countywide	02	0400CST 1410CST			0	0	6K		Flood
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#### Kay County

Ponca City	02	0400CST			0	0	1K		Lightning
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#### Comanche County

1 N Ft Sill Aaf	02	0920CST			0	0			Hail (1.00)
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#### Garfield County

5 N Garber	02	1100CST			0	0			Flood
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#### Hughes County

Lamar	02	1930CST			0	0			Hail (1.75)
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Thunderstorms developed over portions of central Oklahoma on the 2nd resulting in flooding across Kay and Garfield Counties and scattered reports of large hail and damaging straight-line winds. A house on Breckinridge Road in Enid in Garfield County was struck by lightning just after midnight blowing out a brick wall and starting a small fire. Another fire started by lightning occurred a few hours later in Ponca City in Kay County where a banner at a house in the 3200 block of North 14th St. was struck, which then ignited a small fire. Between 6 and 8 inches of rain fell across much of Kay County during the early morning. The Bois D'Arc Creek and many other smaller streams nearby overflowed their banks resulting in numerous roads being closed, including portions of Highway 177, Highway 11, Highway 60, the Highland Extension, State Highway 156 at the Salt Fork River, many city streets in Ponca City, and 13th Street south of Blackwell. Several vehicles were washed off of Highway 177, 4 miles south of Ponca City at 0400 CST, while 3 other vehicles were washed off of a road 3 miles northwest of Ponca City at 0900 CST. Another vehicle traveled beyond a barricade 1 mile northwest of Ponca City at 1410 CST and was washed off of the road. Three occupants needed to be rescued from flooded cars, but they were uninjured. Two homes also had to be evacuated. Three to 6 inches of rain fell across Garfield County causing the Red Rock Creek north of Garber to overflow its banks. Highway 74 needed to be closed for several hours. The only report of wind damage came from 3 miles south of Blanchard in McClain County at 0330 CST, where 10 inch

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

diameter tree limbs where blown down and barn doors were blown off.

#### Woodward County

5 NE Sharon 04 1324CST 0 0 Hail (0.75)

#### Major County

19 NNW Chester 04 1407CST 0 0 Hail (2.00)

#### Woodward County

4 E Quinlan 04 1407CST 0 0 Hail (2.00)

#### Major County

17 NNE Chester 04 1419CST 0 0 Hail (1.25)

#### Woods County

8 SSE Waynoka 04 1419CST 0 0 Hail (1.25)

#### Woods County

11 SSW Dacoma to 5 SSE Dacoma 04 1425CST 8 440 0 0 25K Tornado (F1)  
1438CST

#### Alfalfa County

4 WNW Carmen to 4 NW Carmen 04 1438CST 2 440 0 0 55K Tornado (F2)  
1443CST

#### Major County

8 N Orion 04 1500CST 0 0 Hail (2.50)

#### Alfalfa County

5 SE Cherokee 04 1505CST 0.1 25 0 0 0 Tornado (F0)

#### Alfalfa County

3 S Aline 04 1509CST 0 0 Hail (2.75)

#### Major County

3 N Cleo Spgs 04 1509CST 0 0 Hail (2.75)

#### Custer County

Arapaho 04 1517CST 0 0 Hail (0.75)

#### Grant County

5 W Medford 04 1604CST 0.1 25 0 0 0 Tornado (F0)

#### Custer County

7 SE Thomas 04 1610CST 0 0 Hail (1.00)

#### Comanche County

1 N Mt Scott 04 1613CST 0 0 Hail (1.75)

#### Grant County

6 NE Nash 04 1613CST 0 0 Hail (0.88)

#### Grant County

Hawley 04 1620CST 0 0 Hail (0.75)

#### Caddo County

Apache 04 1625CST 0 0 Hail (1.75)

#### Comanche County

Lake Ellsworth 04 1627CST 0 0 Hail (0.88)

#### Kiowa County

Mountain Park 04 1630CST 0 0 20K Hail (2.75)

#### Caddo County

2 W Cyril 04 1634CST 0 0 Hail (0.88)

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

<b>Blaine County</b>									
8 SW Watonga to 6.5 SW Watonga	04	1638CST 1641CST	1.5	25	0	0	0		Tornado (F0)
<b>Kay County</b>									
Ponca City	04	1645CST			0	0	45K		Thunderstorm Wind (G78)
<b>Blaine County</b>									
3 SW Watonga to 9 ENE Watonga	04	1650CST 1712CST	12	200	0	0	50K		Tornado (F2)
<b>Caddo County</b>									
11 W Apache	04	1650CST			0	0			Hail (1.75)
<b>Caddo County</b>									
3 NE Cement	04	1710CST			0	0			Hail (0.88)
<b>Grady County</b>									
4 SW Norge	04	1710CST			0	0			Hail (0.88)
<b>Comanche County</b>									
5 N Medicine Park	04	1714CST	0.3	50	0	0	0		Tornado (F0)
<b>Canadian County</b>									
2 NW Scott	04	1715CST			0	0			Hail (0.75)
<b>Kingfisher County</b>									
6 SW Dover to 2 SE Dover	04	1728CST 1742CST	7	100	0	0	30K		Tornado (F1)
<b>Canadian County</b>									
12 WSW El Reno	04	1730CST			0	0			Hail (1.25)
<b>Caddo County</b>									
1 NE Cyril	04	1745CST	0.5	25	0	0	7K		Tornado (F0)
<b>Caddo County</b>									
2 W Cyril	04	1745CST			0	0			Thunderstorm Wind (G52)
<b>Logan County</b>									
Guthrie	04	1745CST			0	0	15K		Thunderstorm Wind (G61)
<b>Payne County</b>									
10 W Stillwater to 8 WNW Stillwater	04	1747CST 1751CST	3	100	0	0	5K		Tornado (F0)
<b>Noble County</b>									
10.5 SSE Perry to 10 SE Perry	04	1751CST 1756CST	3	100	0	0	30K		Tornado (F1)
<b>Grady County</b>									
9 WSW Ninnekah to 7.5 WSW Ninnekah	04	1754CST 1755CST	1.5	200	0	0	50K		Tornado (F2)
<b>Kingfisher County</b>									
Dover	04	1811CST			0	0			Hail (1.00)
<b>Grady County</b>									
2 W Chickasha	04	1813CST			0	0			Hail (1.00)
<b>Cleveland County</b>									
Norman	04	1900CST			0	0			Hail (0.75)
<b>Cleveland County</b>									
Norman	04	1900CST			0	0	5K		Lightning
<b>Kay County</b>									
Blackwell	04	1900CST			0	0			Hail (0.88)

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Kay County

Braman 04 1900CST 0 0 Hail (0.88)

#### Grady County

4.5 N Middleberg to 7 NE Middleberg 04 1915CST 3 100 0 0 125K Tornado (F2)  
1918CST

#### Grady County

7 S Tuttle 04 1915CST 0 0 30K Thunderstorm Wind

#### Mcclain County

Dibble 04 1915CST 0 0 5K Thunderstorm Wind

#### Mcclain County

4 SW Newcastle to 2 SSW Newcastle 04 1918CST 2 50 0 0 5K Tornado (F0)  
1921CST

#### Mcclain County

3 N Newcastle to 4 N Newcastle 04 1926CST 1 33 0 0 0.50K Tornado (F0)  
1927CST

#### Cleveland County

5.5 WSW Moore to 5 WSW Moore 04 1927CST 0.5 33 0 0 0.50K Tornado (F0)  
1928CST

#### Oklahoma County

Tinker Afb 04 1932CST 0 0 Thunderstorm Wind (G55)

#### Cleveland County

Moore 04 1934CST 3 580 0 0 2M Tornado (F2)  
1941CST

#### Cleveland County

Oklahoma City 04 1935CST 0 0 Hail (0.88)  
Hail was reported near 89th and Penn.

#### Oklahoma County

8 WNW Edmond 04 1949CST 0 0 Hail (0.75)

#### Kingfisher County

9 S Kingfisher 04 1955CST 0 0 Hail (0.75)

#### Kingfisher County

5 SSW Cashion 04 2000CST 0 0 Hail (1.00)

#### Canadian County

1.5 S Okarche 04 2010CST 0 0 Hail (0.88)

#### Pottawatomie County

Shawnee 04 2010CST 0 0 0.50K Thunderstorm Wind

#### Logan County

4 WSW Guthrie 04 2020CST 0 0 Thunderstorm Wind (G57)

#### Kay County

Blackwell 04 2022CST 0 0 Hail (0.75)

#### Mcclain County

1 SW Newcastle to 1 S Newcastle 04 2023CST 0 0 1K Thunderstorm Wind  
2025CST

#### Lincoln County

4 SE Meeker to 5 E Meeker 04 2037CST 3 580 0 0 60K Tornado (F2)  
2040CST

#### Lincoln County

7 W Prague to 4 NW Prague 04 2045CST 6 580 0 0 40K Tornado (F2)  
2052CST

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Lincoln County

6 W Prague to 3 NW Prague	04	2045CST 2052CST			0	0	20K		Thunderstorm Wind
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#### Pottawatomie County

3 NW Shawnee to 3 NNE Shawnee	04	2048CST 2058CST			0	0	1.5M		Thunderstorm Wind
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#### Lincoln County

Prague	04	2050CST			0	0	10K		Thunderstorm Wind
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#### Pottawatomie County

1 SW Dale	04	2050CST			0	0	15K		Thunderstorm Wind
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#### Pottawatomie County

3 NW Shawnee to 3 N Shawnee	04	2050CST 2055CST	3	100	0	0	40K		Tornado (F1)
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#### Pottawatomie County

2 W Shawnee to 3 E Shawnee	04	2050CST 2105CST			0	0	1M		Thunderstorm Wind
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#### Lincoln County

6 NW Prague to 7 NNE Prague	04	2052CST 2108CST	8	440	0	6	50K		Tornado (F1)
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#### Pottawatomie County

3 NNW Shawnee	04	2055CST			0	0			Thunderstorm Wind (G63)
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#### Pottawatomie County

Shawnee to 2 E Shawnee	04	2058CST 2100CST	2	100	0	0	75K		Tornado (F1)
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#### Seminole County

5 WNW Little to 6.5 NNW Little	04	2108CST 2117CST	6	880	0	0	75K		Tornado (F2)
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#### Pottawatomie County

12.5 ENE Shawnee to 19 NE Shawnee	04	2117CST 2125CST	4	880	0	1	1.5M		Tornado (F3)
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#### Noble County

Red Rock	05	0100CST 0700CST			0	0	200K		Flood
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#### Lincoln County

Countywide	05	0400CST 0600CST			0	0	500K		Flood
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#### Payne County

Countywide	05	0400CST 0600CST			0	0	0		Flood
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A major severe weather outbreak occurred across western and central Oklahoma from the afternoon of the 4th through the early morning of the 5th, resulting in 19 tornadoes, straight-line wind damage, hail as large as baseballs, and significant flooding across portions of Lincoln and Noble Counties, where numerous costly bridges were destroyed.

Thunderstorms first developed over northwest Oklahoma during the early and mid-afternoon where hail larger than golf balls was reported in Major and Woodward Counties. The first of 19 tornadoes occurred at 1425 CST in Woods County 11 miles south-southwest of Dacoma. A media storm chaser observed this multiple vortex tornado as it touched down in southeastern Woods County and traveled northeast into western Alfalfa County before dissipating 4 miles northwest of Carmen. Damage was first reported south of Dacoma where an old abandoned house was damaged and a barn and garage were destroyed. As the tornado moved into western Alfalfa County, an office building at Carmen Field Limited Partnership and a local gas plant were completely destroyed. A modular home adjacent to the gas plant also had most of its roof blown off. Numerous witnesses described this tornado (F2) as very large and was at least a quarter of a mile wide. The 2nd tornado, an F0, developed on the salt flats 5 miles southeast of Cherokee in Alfalfa County and was seen by an Alfalfa County Sheriff's Deputy. The 3rd tornado was witnessed by a state trooper touching down very close to Highway 11, 5 miles west of Medford in Grant County, and was on the ground for less

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	October 1998	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops		

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

s than one minute with no known damage (F0). As the thunderstorms associated with these tornadoes moved east, additional thunderstorms began to intensify farther south. Near Mountain Park in Kiowa County, Baseball size hail destroyed numerous car windshields. A short while longer, at 1638 CST, the 4th tornado was captured on video by a reliable storm chaser 9 miles southwest of Watonga in Blaine County. This tornado touched down for only a few seconds in an open field with no known damage (F0).

Several storage buildings at a Lowe's Department Store in Ponca City in Kay County, were blown over by winds estimated between 80-90 mph. The 5th tornado touched down 2.5 miles southwest of Watonga in Blaine County and crossed US-270/281 two miles south of Watonga. The tornado continued to the northeast and finally dissipated about 9 miles east-northeast of Watonga. At least three homes suffered significant damage, one of which had its roof completely removed (F2). The 6th tornado was seen by an Oklahoma Highway Patrol Officer 5 miles north of Medicine Park in Comanche County touching down briefly in an open field with no known damage (F0). The 7th tornado, an F1, touched down 6 miles southwest of Dover in Kingfisher County and traveled northeast for 7 miles, crossing Highway 81 near the Cimarron River, and dissipating 2 miles southeast of Dover. One haybarn was destroyed, while 1 residence and 5 barns were damaged. Numerous trees and power lines were also downed. The 8th tornado, an F0, touched down just west of the intersection of US-277 and SH-8, 1 mile north of Cyril in Caddo County, and moved east for one-half mile knocking down trees and power lines and causing minor roof damage in the extreme northeastern portion of Cyril.

While straight-line winds damaged a roof at the Farmers Coop Association building, and a trailer home in Guthrie in Logan County at 1745 CST, the 9th tornado touched down at 1747 CST on or just south of Lake Carl Blackwell in Payne County, and was observed by numerous people in and near Stillwater. The tornado moved northeast over the lake, crossed into extreme southern Noble County, and over Lake McMurtry. Minor damage was reported in northern Payne County, however the worst damage occurred in southern Noble County as the tornado moved off of Lake McMurtry and severely damaged a mobile home (F1). The 10th tornado (F2) was witnessed by 3 firefighters 1 mile south of Highway 277 on Lake Burtshi Road 9 miles west-southwest of Ninnekah in Grady County, and was on the ground for 1.5 miles. One mobile home was disintegrated, while 2 others nearby were flipped over. Many well-structured homes sustained minor roof damage, and numerous trees were blown over, some onto homes and one onto an RV. A storage building was also destroyed. The 11th tornado, also an F2, touched down in Grady County, 4.5 miles north of Middleburg, damaging several mobile homes and outbuildings. One mobile home was completely destroyed in the Bridge Creek area while two others were blown over. Scattered tree damage continued for 5 miles into McClain county just to the southwest of the Newcastle city limits. Wind damage continued into the south part of Newcastle causing damage to trees and power lines. In addition to the tornado damage, straight-line winds overturned several tractor-trailers 7 miles south of Tuttle, also in Grady County, and destroyed a barn in Dibble in McClain County. Lightning also struck a house on Broadway in Norman in Cleveland County, causing a small fire at 1900 CST.

The 12th tornado (F0) developed at 1926 CST 3 miles north of Newcastle in McClain County, and was observed by people from Norman, Moore and Newcastle. This tornado touched down just northeast of the intersection of I-44 and North 32nd Street north of Newcastle, and moved north into extreme western Cleveland County near SW 149th St. and Meridian Avenue, in southwest Oklahoma City. Damage was primarily to trees. The 13th tornado was one of the most destructive tornadoes of the outbreak, developing over the city of Moore in Cleveland County about 1/2 mile north of SW 19th Ave, just east of Santa Fe Ave. The tornado tracked almost due north at first, and then curved slightly east of north. Many homes lost all or parts of their roofs, leaving them uninhabitable, and one home lost a portion of an exterior wall. Sections of roofs were also torn off of a few warehouses as the tornado crossed Shields Ave. and then dissipated just west of I-35. The worst damage occurred along NW 12th Ave to the west of Janaway where F2 damage was observed. In total, 10 single-family residences were either destroyed or severely damaged; 8 multi-family buildings were severely damaged; and hundreds of other homes and businesses sustained minor damage. Damage estimates were near 2 million dollars.

The 14th tornado touched down near EW 106 road and NS 346 Road 4 miles southeast of Meeker in Lincoln County, where light damage occurred to many trees. The tornado then moved northeast crossing EW 347 south of US 62. Damage was observed from just south of this intersection southward for about one mile. Just south of the intersection, trees were downed and a house received damage to the roof and porch. F2 damage occurred about 1/2 mile south of US 62, where three homes received significant roof damage, and an RV was pushed over onto its side. The tornado crossed US 62 with light damage to trees and minor damage to a house along the highway. The tornado likely dissipated just northeast of the intersection of US 62 and NS 347 Road. The 15th tornado, also an F2, developed a few minutes after the last tornado about 7 miles west of Prague. This tornado touched down near NS 348 road about 1/2 mile north of EW 106 Road where a mobile home received light damage. The tornado moved northeast crossing near the intersection of EW 105 Road and NS 349 Road, then grew in size and intensity before crossing US 62. A mobile home along US 62 just west of NS 350 Road was destroyed. The metal frame that supported the home and most of the contents was deposited northwest of the original location up to 150 yards. Other debris was thrown north-northeast across US 62. The tornado then continued northeast and damage was noted for 3/4 of a mile along NS 350 Road centered on US 62. Slight damage to trees and outbuildings was observed along NS 352 Road approximately 2 miles north of US 62. The tornado probably dissipated northeast of this point, although roads became inaccessible due to flooding and made it difficult to determine the exact location. In addition, a 6 mile long swath of damaging straight-line winds accompanied this tornado from 6 miles west of Prague to 3 miles

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property		

October 1998

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

and power lines in Shawnee in Pottawatomie County at 2010 CST, and for a wind gust of 64 mph at 2020 CST, 4 miles west-southwest of Guthrie in Logan County, measured by Oklahoma Mesonet.

Another tornado, the 16th of the outbreak, developed at about the same time 6 miles northwest of Prague, and moved northeast for 7 miles before dissipating 7 miles north-northeast of Prague. This tornado, rated an F1, touched down at the intersection of EW 102 Road and NS 350 Road where outbuildings received moderate damage. Less than 1/4 of a mile away on EW 102 Road, a mobile home was lifted and thrown east about 100 yards, uprooting a power pole while airborne. The mobile home was destroyed upon impact. All 6 family members who took shelter inside an interior closet were injured. All injuries were minor, except for the father who suffered broken ribs, a cracked pelvis and head injuries. He stayed overnight in a nearby hospital and was released the next day. As the tornado continued east-northeast along NS 352 Road, south of the community of Wilzetta, an outbuilding was unroofed, minor damage occurred to a house roof, and trees were uprooted. Tree and power line damage continued to about 2 or 3 miles east of Wilzetta. The tornado then turned more to the northeast as it crossed SH 99 where a mobile home received minor damage, 3 outbuildings were destroyed, a few logs at a sawmill were tossed, and trees were downed. Scattered tree damage was observed to just southwest of the intersection of NS 357 Road and EW 99 Road where the tornado lifted. In addition to the tornadoes near Prague, straight-line winds were responsible for downing numerous trees and awnings of several businesses in downtown Prague.

Farther south in Pottawatomie County, 2 tornadoes (Numbers 17 and 18 of the outbreak) embedded in larger swaths of damaging straight-line winds, developed near Shawnee. The first one touched down 3 miles northwest of Shawnee and remained on the ground for 3 miles before dissipating 3 miles north of Shawnee. A large swath of damaging straight-line winds approximately 1 mile wide and 4 miles long accompanied this F1 tornado as it moved across northern portions of Shawnee. Extensive tree damage occurred on a private golf course just west of Acme road. Minor damage also occurred to the roof of the clubhouse and to the roof-mounted air conditioning unit. Widespread tree and roof damage also occurred in a subdivision south of 45th St. and west of Kickapoo. In addition to a mobile home being destroyed near the east end of the damage path, which is believed to be the result of a tornado, many other mobile homes nearby received minor damage. In addition, 1 mile southeast of Dale in Pottawatomie County, numerous trees and signs were either destroyed or uprooted along Interstate 40; a shed was destroyed, and a barn was unroofed along Highway 102. Oklahoma Mesonet also measured a wind gust of 72 mph at 2055 CST, 3 miles north-northwest of Shawnee.

The 2nd tornado, also an F1 and the 18th tornado of the outbreak, developed in or very close to the Shawnee business district, moved east for 2 miles, and was also accompanied by a large area of damaging straight-line winds. The exact damage resulting from the tornado was difficult to assess, but it is believed it was limited to fallen trees, downed power lines, and minor roof and structural damage to many homes. The area of straight-line wind damage was approximately 2.5 miles wide and 5 miles long, and occurred from the western side of Shawnee to the eastern side of Shawnee. Damage included widespread fallen trees in a suburban area north of Highland extending several blocks either side of Kickapoo, in the Woodland Park area, Boy Scout Park, and in the rural area along and south of Farrel Road between Harrison and Bryan. One tree fell on and heavily damaged the Beard House, a local landmark that was the first homestead built in Shawnee in 1895. An east-facing cinder block wall of a warehouse was blown outward in the vicinity of Minnesota and Pennsylvania Streets, and structural damage occurred to many buildings in downtown Shawnee, including toppled brick walls and broken windows. The combination of widespread straight-line wind damage and a tornado resulted in major damage over a very large area.

The 19th and last tornado of the outbreak touched down 5 miles west-northwest of Little, near the intersection of EW 114 Road and NS 351 Road in northwestern Pottawatomie County, where minor tree damage was observed. The tornado, an F3, then increased in size to approximately a 1/2 mile wide as it moved northeast. As it crossed NS 351 Road and then EW 113 Road, a number of outbuildings were heavily damaged, and trees were snapped. Three mobile homes received light damage near the north edge of the path, and 3 other homes received light damage to shingles. The tornado crossed Interstate 40 blowing over a truck which was carrying hazardous materials. The tornado then continued northeast unroofing a mobile home, causing damage to trees and destroying a number of outbuilding before crossing the North Canadian River into northeast Pottawatomie County. Along EW 110 Road, significant tree damage was observed, and a barn was partially unroofed. The community of Center View near the intersection of SH 99 and EW 109 Road was then hard hit with most of the damage south and east of this intersection. From the debris pattern, the center of the tornado crossed Highway 99 one-half mile south of EW 109 Road. A house along Highway 99 was unroofed and lost most of its exterior walls. Three homes suffered major damage along EW 109 Road. Two other homes suffered significant damage. As the tornado continued moving northeast another home suffered significant roof damage, and the south facing brick wall was buckled. The garage was destroyed. Steel and cinder block from the garage were impaled in a tree. There was also significant damage to large trees. Farther northeast, damage to a roof was noted, and a large number of power lines were downed along NS 357 Road near the intersection of EW 108 Road. One outbuilding was damaged, and light damage was observed in trees just south of EW 107 Road. In total, at least 60 homes or businesses were damaged.

Major flooding developed across Noble, Lincoln, and Payne Counties shortly after midnight on the 5th. Red Rock Creek and Black Bear Creek near Red Rock in Payne County, overflowed their banks between Highway 77 and Interstate 35 washing away several small bridges. Damage was estimated at 200 thousand dollars. Six to seven inches of rain fell across a large portion of Lincoln

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

several small bridges. Damage was estimated at 200 thousand dollars. Six to seven inches of rain fell across a large portion of Lincoln County. At least 3 bridges were washed away by the floods including 1 bridge 1 mile east of Kendrick, and dozens of roads suffered erosion damage. Creeks also overflowed their banks in Stroud, Davenport, and Agra. At least 500 thousand dollars in damage resulted. Between 4 and 5 inches of rain fell across Payne County forcing the Cu Chee Creek to overflow its banks, flooding many roads in Cushing and Stillwater.

#### Oklahoma County

<b>Oklahoma City</b>	<b>17</b>	<b>1150CST</b>			<b>0</b>	<b>0</b>			<b>Thunderstorm Wind (G61)</b>
The Sheriff's Office reported wind gusts of 70 mph at 206th and N. May.									

#### Oklahoma County

<b>Bethany</b>	<b>28</b>	<b>1630CST</b>			<b>0</b>	<b>0</b>	<b>200K</b>		<b>Lightning</b>
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#### Logan County

<b>6 N Meridian</b>	<b>28</b>	<b>1655CST</b>	<b>0.3</b>	<b>25</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>Tornado (F0)</b>
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Widely scattered thunderstorms developed over portions of central Oklahoma during the afternoon of the 28th. One thunderstorm was responsible for a lightning strike at a home in the Brownsville addition in Bethany, which is in Oklahoma County. The result was a fire that destroyed much of the house. There was also a report of a small and brief tornado witnessed by a local TV media chaser 6 miles north of Meridian in Logan County. No damage was reported (F0).

#### Oklahoma County

<b>Oklahoma City</b>	<b>30</b>	<b>0735CST</b>			<b>0</b>	<b>0</b>	<b>100K</b>		<b>Lightning</b>
Lightning struck the roof of a house on Northwest 197 starting a large fire that caused major damage.									

#### Woods County

<b>1 N Freedom</b>	<b>30</b>	<b>2000CST</b>			<b>0</b>	<b>0</b>	<b>3K</b>		<b>Lightning</b>
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Lightning struck the basement of a house blowing a hole in the concrete and destroying a television, VCR, satellite, telephones, and all of the electrical wiring in the house.

#### Beckham County

<b>3 N Elk City</b>	<b>31</b>	<b>1515CST</b>			<b>0</b>	<b>0</b>	<b>50K</b>		<b>Lightning</b>
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#### Alfalfa County

<b>Countywide</b>	<b>31</b>	<b>2100CST</b>			<b>0</b>	<b>1</b>			<b>Flood</b>
		<b>2359CST</b>							

#### Dewey County

<b>Countywide</b>	<b>31</b>	<b>2100CST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
		<b>2359CST</b>							

#### Garfield County

<b>Countywide</b>	<b>31</b>	<b>2100CST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
		<b>2359CST</b>							

#### Grant County

<b>Countywide</b>	<b>31</b>	<b>2100CST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
		<b>2359CST</b>							

#### Kay County

<b>Countywide</b>	<b>31</b>	<b>2100CST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
		<b>2359CST</b>							

#### Major County

<b>Countywide</b>	<b>31</b>	<b>2100CST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
		<b>2359CST</b>							

#### Noble County

<b>Countywide</b>	<b>31</b>	<b>2100CST</b>			<b>0</b>	<b>0</b>			<b>Flood</b>
		<b>2359CST</b>							

#### Woods County

<b>Countywide</b>	<b>31</b>	<b>2100CST</b>			<b>1</b>	<b>0</b>			<b>Flood</b>
		<b>2359CST</b>							

F19IW

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	October 1998
					Killed	Injured	Property Crops	Character of Storm

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Blaine County

##### Watonga

**31 2200CST 0 0 8K Lightning**  
Very heavy rainfall fell over the northern half of the NWSO Norman, OK Hydrologic Services Area (HSA) during late October and early November. Precipitation totals between 3 and 11 inches were recorded during the three-day period of October 31-November 2, 1998 at locations in west-central, northwestern, central and north-central Oklahoma. Some of the heaviest rains fell over river basins in northern Oklahoma where soil moisture conditions were already moist from previous precipitation events in early and mid October. As a result of the heavy rainfall and moist soil conditions, major to to record flooding was seen in north-central Oklahoma along the Salt Fork of the Arkansas and Chikaskia Rivers. Moderate to major flooding plagued the Cimarron river basin in northwestern and central Oklahoma while minor flooding was observed along the North Canadian and Canadian Rivers in west-central and centra Oklahoma. Crests above flood stage were recorded at a total of 16 forecast points and 6 data points in the HSA. Numerous flood warnings and flood statements were issued covering a total of 17 counties.

One fatality and one injury occurred during the flood event in Alfalfa County. A 19-year-old woman drowned when floodwaters from Eagle Chief Creek swept her car off of State Highway 8B just east of Aline in southwestern Alfalfa County. The victim was eight months pregnant at the time of the accident. The accident occurred at about 10 p.m. CST on Saturday, October 31st, while heavy rains were occurring in the area. The driver, who was the 45-year-old mother of the flood victim, managed to take refuge in a tree and was not rescued until 9 a.m. CST on Monday, November 2nd. She sustained leg and arm injuries and was also treated for hypothermia. All of the river crests occurred on the 1st or 2nd of November along with the majority of property damage. Refer to November's edition of Storm Data for more details or additional information.

In addition to the flooding, Lightning struck an oil tank at the Armstrong Disposal Well 3 miles north of Elk City in Beckham County causing a fire which took 2 fire departments to extinguish. Lightning also struck a tree on 4th St. in Watonga in Blaine County, which then fell on 3 parked cars.

### TEXAS, Central Southeast

#### Brazos County

**5 E College Station to 17 1540CST 3.5 75 0 0 20K Tornado (F1)**  
**8 NE College Station**  
Utility poles downed and roof damage on the outskirts of Bryan College Station.

#### Brazos County

**College Station 17 1850CST 0 0 5K Flash Flood**  
**2300CST**  
Street flooding in College Station as well as along frontage roads of HWY 6.

#### Madison County

**Madisonville 17 1850CST 0 0 5K Flash Flood**  
**2300CST**  
Street flooding in and around Madisonville. HWY 90 and FM 978 closed due to high water.

#### Washington County

**3.5 E Brenham 17 1850CST 1 25 0 0 Tornado (F0)**  
**1853CST**  
DPS reported tornado. No damage reported.

#### Houston County

**Austonia 17 2030CST 0 0 5K Flash Flood**  
**2300CST**  
Street flooding in Austonio and Lovelady.

#### Washington County

**Brenham 17 2218CST 0 0 5K Flash Flood**  
**2300CST**  
Street flooding.

#### Austin County

**Countywide 17 2221CST 0 0 50K Flash Flood**  
**18 0700CST**  
Major flooding across the county, especially the southern half near Sealy and San Felipe. HWY 36 flooded.I-10 closed near mile marker 725 with 15 to 20 rescues of stranded motorists by 236 am. San Felipe evacuated at 355 am.

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

#### Colorado County

East Portion	17	2245CST			0	0	25K		Flash Flood
	18	0700CST							

Major flooding across the county, especially in Eagle Lake, Garwood, and Nada.

#### Harris County

Katy	17	2300CST			0	0	5K		Thunderstorm Wind
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Trees and powerlines blown down.

#### Wharton County

Countywide	17	2300CST			0	0	50K		Flash Flood
	18	0700CST							

FM 102 north of Egypt closed and water entering nearby homes. Major flooding across NW parts of county. Elm Grove subdivision in northern Wharton County had 1 foot of water in them.

#### Harris County

Houston	18	0000CST 0005CST	1	25	0	0	20K		Tornado (F0)
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Magnolia and Pine Forest subdivisions had some roof damage, trees and powerlines downed.

#### Harris County

Cypress	18	0345CST 0347CST	1	25	0	0	25K		Tornado (F0)
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Minor structural damage and trees down.

#### Harris County

North Portion	18	0348CST 0700CST			0	0	10K		Flash Flood
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Street flooding, especially near Hooks Airport.

#### Harris County

8 WNW Bammel to 7 WNW Bammel	18	0400CST 0402CST	1	25	0	0	10K		Tornado (F0)
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Trees blown down and minor damage to homes.

#### Montgomery County

Countywide	18	0400CST 0700CST			0	0	15K		Flash Flood
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Major flooding beginning to occur countywide.

#### Liberty County

Plum Grove	18	0430CST 0432CST	0.5	25	0	0	30K		Tornado (F0)
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Tornado touchdown in Plum Grove on FM 1010. Mobile homes damaged and trees/powerlines down.

#### Houston County

Crockett	18	0500CST 0800CST			0	0	5K		Flash Flood
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Street flooding in Crockett.

#### Washington County

Countywide	18	0515CST 1300CST			0	0	35K		Flash Flood
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Flooded roads countywide. Bridge washed out at Wonderhill Rd.

#### Waller County

Brookshire	18	0525CST 0528CST	1	50	1	1	75K		Tornado (F2)
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Tornado destroyed mobile home. One person killed and another injured in the home. Nine other homes damaged and 2 barns destroyed. M47MH

#### Brazos County

Countywide	18	0545CST 1300CST			0	0	15K		Flash Flood
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HWY 30 between HWY 6 & FM 158 closed due to flooding. Secondary roads flooded elsewhere.

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

#### Jackson County

Edna to Countywide	18	0629CST 1300CST			0	0	15K		Flash Flood
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Street flooding in Edna became more widespread through the period.

#### Austin County

Countywide	18	0706CST 1100CST			0	0	15K		Flash Flood
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Major flooding countywide.

#### Colorado County

Countywide	18	0706CST 1100CST			0	0	15K		Flash Flood
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Major flooding countywide.

#### Harris County

Countywide	18	0706CST 1100CST			0	0	100K		Flash Flood
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Major flooding countywide.

#### Montgomery County

Countywide	18	0706CST 1100CST			0	0	75K		Flash Flood
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Major flooding countywide.

#### Waller County

Countywide	18	0706CST 1100CST			0	0	15K		Flash Flood
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Major flooding countywide.

#### Wharton County

Countywide	18	0706CST 1100CST			0	0	15K		Flash Flood
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Major flooding countywide.

#### Liberty County

Countywide	18	0901CST 1300CST			0	0	15K		Flash Flood
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Major flooding countywide.

#### Madison County

Countywide	18	0901CST			0	0	10K		Flash Flood
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FM 2289 & FM 1428 flooded.

#### Fort Bend County

Countywide	18	0930CST 1100CST			0	0	10K		Flash Flood
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Training rains caused numerous flooded roads.

#### Chambers County

North Portion	18	0945CST 1300CST			0	0	5K		Flash Flood
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I-10 at HWY 565 flooded.

#### Brazoria County

Brazoria	18	1024CST 1230CST			0	0	3K		Flash Flood
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Minor street flooding.

#### Galveston County

Friendswood	18	1024CST 1230CST			0	0	3K		Flash Flood
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Minor street flooding.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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October 1998

## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

#### San Jacinto County

Countywide	18	1030CST 1100CST			0	0	10K		Flash Flood
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Training rains caused numerous roads to flood.

#### Austin County

Countywide	18	1102CST 1500CST			0	0			Flash Flood
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Major flooding continues.

#### Colorado County

Countywide	18	1102CST 1500CST			0	0			Flash Flood
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Major flooding continues.

#### Fort Bend County

Countywide	18	1102CST 1500CST			0	0			Flash Flood
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Major flooding continues.

#### Harris County

Countywide	18	1102CST 1500CST			0	0			Flash Flood
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Major flooding continues.

#### Montgomery County

Countywide	18	1102CST 1500CST			0	0			Flash Flood
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Major flooding continues.

#### San Jacinto County

Countywide	18	1102CST 1500CST			0	0			Flash Flood
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Major flooding continues.

#### Waller County

Countywide	18	1102CST 1500CST			0	0			Flash Flood
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Major flooding continues.

#### Wharton County

Countywide	18	1102CST 1500CST			0	0			Flash Flood
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Major flooding continues.

#### Chambers County

Countywide	18	1307CST 1600CST			0	0			Flash Flood
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Flooding continues

#### Liberty County

Countywide	18	1307CST 1600CST			0	0			Flash Flood
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Flooding continues.

#### Jackson County

Countywide	18	1319CST 1700CST			0	0			Flash Flood
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Flooding continues.

#### Brazos County

College Station	18	1640CST 1900CST			0	0	2K		Flash Flood
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Street flooding in College Station.

# Storm Data and Unusual Weather Phenomena

October 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

#### Jackson County

Countywide	18	1707CST			0	0			Flash Flood
		2000CST							

Flooding continues. Numerous roads closed.

#### Jackson County

Countywide	18	2012CST			0	0			Flash Flood
	19	0100CST							

Flooding continues.

### TEXAS, Western North

#### Archer County

6 S Archer City	02	1610CST			0	0			Hail (0.88)
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#### Archer County

6 S Archer City	02	1612CST			0	0			Hail (0.88)
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#### Archer County

4 S Archer City	05	1440CST			0	0			Hail (1.75)
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#### Clay County

1 S Joy	05	1510CST			0	0			Hail (0.75)
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# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	November 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## ADDITIONS/CORRECTIONS

### AMERICAN SAMOA

ASZ001>004

Swains - Tutuila - Manu'A - Rose

01	0000SST	0	0	Drought
30	2359SST			

American Samoa remains in drought conditions, and this past November was the hottest November on record with the very strong El Nino. The average for November is 10.84 in., but the recorded rainfall for this month, at WSO-Pago Pago, was 3.22 in.

### ARIZONA, Southwest

Yuma County

Yuma	28	1530MST	0	0	Urban/Sml Stream Fld
		1653MST			

Locally heavy rain resulted in street flooding in parts of the city. Barricades were used in some intersections. One of the heaviest amounts was .38 in just 25 minutes.

AZZ022

Northwest Maricopa County

29	0723MST	0	0	Fog
	0940MST			

Dense fog cut the visibility to about 500 feet in the Wickenburg area.

### CALIFORNIA, Western

CAZ005>008-010-075 Sonoma / Marin Counties - San Francisco County - Alameda / Contra Costa Counties - Santa Clara County - Salinas Valley / Interior Monterey County / San Benito County - San Mateo Co.

29	2200PST	0	0	1.8M	High Wind (G75)
30	1111PST				

### OKLAHOMA, Western, Central and Southeast

Alfalfa County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Blaine County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Caddo County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Canadian County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Dewey County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Garfield County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Grady County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Grant County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Kay County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

Kingfisher County

Countywide	01	0000CST	0	0	Flood
	02	2359CST			

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	November 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Lincoln County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

#### Logan County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

#### Major County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

#### Noble County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

#### Oklahoma County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

#### Payne County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

#### Pottawatomie County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

#### Woods County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

#### Woodward County

Countywide	01	0000CST			0	0		Flood
	02	2359CST						

Very heavy rain fell over much of northern Oklahoma during late October and early November. Precipitation totals between 3 and 11 inches were recorded during the three-day period of October 31-November 2, 1998 at locations in west-central, northwestern, central and north-central Oklahoma. Some of the heaviest rain fell over river basins in northern Oklahoma where soil moisture was already very high due to recent precipitation events in early and mid October.

Major to record flooding was seen in north-central Oklahoma along the Salt Fork of the Arkansas and Chikaskia Rivers. Moderate to major flooding plagued the Cimarron river basin in northwestern and central Oklahoma while minor flooding was observed along the North Canadian and Canadian Rivers in west-central and central Oklahoma. Crests above flood stage were recorded at a total of 16 forecast points and 6 data points in the HSA. In total, 17 counties were affected. All of the river crests occurred on the 1st and 2nd of November. The river gage site at Blackwell on the Chikaskia River recorded a new record crest of 34.40 feet at 1630 CST on November 2. Flood stage is 29 feet. The previous record was 34.31 feet set on May 10, 1993. The Salt Fork of the Arkansas River at Tonkawa crested at 26.29 feet, which is the fifth highest crest at the site.

One fatality and one injury occurred during the flood event in Alfalfa County. A 19 year-old woman drowned when floodwaters from Eagle Chief Creek swept her car off of State Highway 8B just east of Aline in southwestern Alfalfa County. The victim was eight months pregnant at the time of the accident. The accident occurred at about 2200 CST on Saturday, October 31st, while heavy rain was falling in the area. The driver, who was the 45 year-old mother of the flood victim, managed to take refuge in a tree and was not rescued until 0900 CST on Monday, November 2nd. She sustained leg and arm injuries and was also treated for hypothermia.

Emergency management officials said that a total 35 homes in the counties of Kay and Grant received major damage, while 22 homes incurred minor damage. Fifty-one of these homes were located in the city of Blackwell in Kay County while the remaining 6 homes were located in Grant County in the city of Jefferson near the Salt Fork of the Arkansas River. Approximately 166 residents were evacuated from the eastern and northern portions Blackwell during the event. Another 15 people were evacuated from areas in Kay County including the area south of White Eagle near the Salt Fork of the Arkansas River. Seven families were evacuated near the city of Tonkawa.

In northwestern Alfalfa County, rainfall amounts of 8 to 13.5 inches caused a diversion dike on Stink Creek to break along the

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated			November 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property	Crops	Character of Storm	

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

northwestern and southern sections of the town of Burlington at 0230 CST on Sunday, November 1st. Approximately 50 people from 25 houses were forced to evacuate to the Burlington City Hall and the Burlington Little Gym. Residents were unable to leave Burlington for most of Sunday as State Highway 8 was flooded. Some unofficial storm total amounts included 13.5 inches 1 mile west of Burlington, 12 inches just north of Burlington and 11.5 inches in Burlington.

In Kay County, numerous farm roads were washed away, and 4 bridges were destroyed. In Alfalfa County, a highway detour on State Highway 11 just west of Burlington was washed away for the second time in 1998 when 10 inches of rain fell in the area. Numerous county bridges were also washed out near Burlington, and the bridge approach on State Highway 11 west of Cherokee in Alfalfa County was destroyed. At about 0600 CST on November 1st, a truck pulling a trailer filled with more than 100 cattle drove off the State Highway 8 bridge at Driftwood Creek, about 4 miles west-northwest of Burlington in northwestern Alfalfa County. The driver survived, but almost all of the cattle drowned.

In Kingfisher County, the Gould Bridge was washed out 12 miles northeast of Kingfisher, and the county road leading to the bridge was heavily damaged. In the city of Kingfisher, sewer drain damage occurred, and four business buildings and homes sustained damage. In Payne County, floodwaters from the Cimarron River and its tributaries destroyed several bridge approaches and flooded many secondary roads near the cities of Stillwater, Perkins and Ripley. Some of the major rivers and creeks which flooded in central and northern Oklahoma include the Cottonwood and Kingfisher Creeks, and the Canadian, Chikaskia, Cimarron, Deep Fork, North Canadian, and Salt Fork of the Arkansas Rivers. In addition, other minor tributaries and streams also overflowed their banks in some areas of the HSA and produced minor to moderate flooding. These streams include the Black Bear, Bloody, Deer, Driftwood, Dead Indian, Eagle Chief, Red Rock, Skeleton and Stink Creeks in Oklahoma.

Many local, state and federal highways were closed in portions of Oklahoma due to the flooding, and widespread areas of agricultural lands and rural roads were also inundated. Some of the road and highway closures included:

#### Alfalfa County

State Highway 11 - U.S. 64 junction closed east of Cherokee to State Highway 38  
State Highway 8B from Cherokee to Aline  
State Highway 8 in Burlington

#### Grant County

State Highway 74 south of Lamont  
U.S. 60 between Lamont and Pond Creek  
State Highway 132 closed 5 miles north of the State Highway 11 junction  
U.S. 81 north of Pond Creek

#### Kay County

Old U.S. 60 near Tonkawa  
U.S. 177 between Blackwell and the Kansas State line  
Hubbard Road between Ponca City and Blackwell  
State Highway 156 south of U.S. 60  
13th Street and Hubbard between Tonkawa and Blackwell  
U.S. 77 and Fountain Road south of Tonkawa  
Old U.S. Highway 60 to State Highway 156  
156 extension between old and new U.S. 60  
Interstate 35 - traffic reduced to one lane in the southbound lanes for 12 hours from 4 a.m. to 4 p.m. 11/2/1998  
State Highway 156 between Ponca City and Marland, OK

#### Kingfisher County

State Highway 51 between Hennessey and Okeene at the Cimarron River  
State Highway 33 in Kingfisher  
U.S. Highway 81 north of Kingfisher  
County Line Road west of Okarche

#### Logan County

State Highway 33 west from Guthrie  
U.S. 77 north of Guthrie  
Broadway between Guthrie and Edmond

#### Noble County

State highway 15 near Red Rock Creek

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	November 1998
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

Oklahoma County  
Waterloo Road and May Avenue  
U.S. 74 in northwest Oklahoma County (4 feet of water over the road)

Payne County  
12th Street in Stillwater  
Intersection of 21st and Sangre in Stillwater  
100 Block of Knoblock in Stillwater  
Prairie Road 1.5 miles south of State Highway 51  
River Road east of Perkins  
Range Road 1.5 miles north of State Highway 33

#### **Alfalfa County**

**Burlington**      09      1805CST      0      0      0.01K      **Thunderstorm Wind**

#### **Garfield County**

**Lahoma**      09      1923CST      0      0      **Hail (0.75)**

#### **Garfield County**

**Drummond**      09      1925CST      0      0      **Hail (1.00)**

#### **Garfield County**

**Drummond**      09      1925CST      0      0      **Thunderstorm Wind (G61)**

#### **Garfield County**

**Enid**      09      1930CST      0      0      0.20K      **Lightning**

#### **Kay County**

**3 W Tonkawa**      09      1945CST      0      0      **Hail (1.00)**

#### **Kay County**

**3 W Tonkawa**      09      1945CST      0      0      **Thunderstorm Wind (G52)**

#### **Tillman County**

**Frederick**      09      1953CST      0      0      **Thunderstorm Wind (G58)**

#### **Kay County**

**Blackwell**      09      1955CST      0      0      **Hail (0.75)**

#### **Caddo County**

**Gracemont**      09      2005CST      0      2      2K      **Lightning**

#### **Kay County**

**Blackwell**      09      2005CST      0      0      **Hail (0.88)**

#### **Kay County**

**Blackwell**      09      2005CST      0      0      **Thunderstorm Wind (G52)**

#### **Comanche County**

**Lawton**      09      2010CST      0      0      **Thunderstorm Wind (G52)**

#### **Caddo County**

**5 N Cyril**      09      2015CST      0      0      1K      **Lightning**

#### **Comanche County**

**4 SE Sterling**      09      2020CST      0      0      25K      **Thunderstorm Wind**

#### **Canadian County**

**Yukon**      09      2027CST      0      0      **Thunderstorm Wind (G54)**

#### **Grady County**

**Chickasha**      09      2034CST      0      0      6K      **Thunderstorm Wind**

#### **Grady County**

**2 SSE Chickasha**      09      2035CST      0      0      **Thunderstorm Wind (G54)**

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage Property	Crops	Character of Storm
					Killed	Injured			

November 1998

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Logan County

Guthrie 09 2040CST 0 0 0.50K Thunderstorm Wind

#### Stephens County

Duncan 09 2045CST 0 0 2K Thunderstorm Wind

#### Payne County

5 W Stillwater 09 2049CST 0 0 0.50K Thunderstorm Wind

#### Oklahoma County

Spencer 09 2053CST  
2145CST 0 0 0.10K Thunderstorm Wind

#### Canadian County

Oklahoma City 09 2054CST 0 0 0.01K Thunderstorm Wind

#### Oklahoma County

Oklahoma City 09 2054CST 0 0 0.01K Thunderstorm Wind

#### Stephens County

10 E Duncan 09 2055CST 0 0 Thunderstorm Wind (G52)

#### Mcclain County

Blanchard 09 2100CST 0 0 0.10K Thunderstorm Wind

#### Oklahoma County

Edmond 09 2100CST 0 0 0.01K Thunderstorm Wind

#### Oklahoma County

Oklahoma City 09 2100CST 0 0 1K Lightning

#### Cleveland County

Norman 09 2105CST 0 0 0.10K Thunderstorm Wind

#### Mcclain County

Purcell 09 2115CST 0 0 0.10K Lightning

#### Mcclain County

1.5 SW Purcell to  
1 E Purcell 09 2115CST  
2118CST 2.5 125 0 0 100K Tornado (F1)

#### Cleveland County

1 W Lexington to  
1 NE Lexington 09 2118CST  
2120CST 2 125 0 0 10K Tornado (F0)

#### Garvin County

1 SW Pauls Valley 09 2135CST 0 0 20K Thunderstorm Wind

#### Carter County

Milo 09 2140CST 0 0 4K Thunderstorm Wind

#### Carter County

Lone Grove 09 2154CST 0 0 0.50K Thunderstorm Wind

#### Murray County

3 E Davis 09 2155CST 0 0 0.50K Thunderstorm Wind

#### Murray County

4 S Davis 09 2155CST 0 0 0.50K Thunderstorm Wind

#### Murray County

Sulphur 09 2155CST 0 0 0.50K Thunderstorm Wind

#### Carter County

Ardmore 09 2159CST 0 0 Thunderstorm Wind (G69)

#### Pontotoc County

11 W Ada 09 2159CST 0 0 Thunderstorm Wind (G52)

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage Property	Crops	Character of Storm
					Killed	Injured			

November 1998

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Pontotoc County

2 W Roff 09 2159CST 0 0 20K Lightning

#### Pontotoc County

1 W Roff 09 2203CST 0 0 Thunderstorm Wind (G57)

#### Seminole County

Seminole 09 2207CST 0 0 1K Thunderstorm Wind

#### Johnston County

Mill Creek 09 2209CST 0 0 1K Thunderstorm Wind

#### Pontotoc County

Ada 09 2209CST 0 0 35K Thunderstorm Wind

#### Seminole County

Sasakwa 09 2210CST 0 0 0.50K Thunderstorm Wind

#### Love County

Marietta 09 2214CST 0 0 50K Thunderstorm Wind

A long line of severe thunderstorms moved across most of western and central Oklahoma during the evening of the 9th producing 1 tornado, widespread straight-line wind damage, and large hail. As the line of thunderstorms moved into northwest Oklahoma, large limbs were downed in Burlington in Alfalfa County. Lightning then started 3 fires as the line of thunderstorms moved east. Lightning first struck a power pole in Enid in Garfield County, causing a power outage and a small fire. Lightning then struck a fence in Gracemont in Caddo County destroying it. Two young boys who were playing next to the fence were injured and needed to be hospitalized. An oil tank battery then exploded 5 miles north of Cyril, also in Caddo County, when lightning struck it. A small fire then started but was quickly extinguished.

Father south in Comanche County, thunderstorm winds produced a 1/4 mile swath of damage 4 miles south of Sterling. A mobile home was destroyed, and several barns were damaged. A house porch was also destroyed. Near Chickasha in Grady County, a storage building was destroyed; another building was damaged, and a portion of a roof from a local tavern was damaged. Trees were blown down across a road in Guthrie in Logan County, while in Duncan in Stephens County, a roof was blown off a storage shed; an airport hangar was damaged, and power lines were downed. Numerous trees were uprooted 5 miles west of Stillwater in Payne County. Numerous large tree limbs were downed on the Oklahoma/Canadian County line and in Spencer and Edmond in Oklahoma County. Lightning also struck a house in the 5000 block of NW 20th St. in Oklahoma City in Oklahoma County causing a fire. Trees were downed in Blanchard in McClain County; a pear tree was blown down in Norman in Cleveland County, and lightning struck a tree in Purcell in McClain County, destroying it.

A small and fast moving tornado, rated an F1, embedded in the line of thunderstorms, then touched down near Purcell in McClain County at S 10th St. and W Brule St., then tracked east-northeast to the main downtown business district. Tree damage was extensive in the southwest part of the city where a barn and home were also damaged. Damage in the downtown business area included collapse of a brick wall, tar roofs blown off, shingle damage, broken windows, and destroyed signs. Tree damage, downed power lines, and minor roof damage was observed in Cleveland County near Lexington.

Two semi-trucks were blown over by straight-line winds on Interstate 35, 1 mile southwest of Pauls Valley in Garvin County, while in Milo in Carter County, the Baptist Church roof was damaged; windows were blown in at the house next to the church, and a twenty-one inch diameter tree was blown down. Also in Carter County in Love Grove, large tree limbs and power lines were downed. Trees were downed and blocked roads in Murray County 3 miles east of Davis, 4 miles south of Davis, and in Sulphur. Lightning also sparked a fire 2 miles west of Roff in Pontotoc County, that consumed 20 large bales of hay. In Ada, also in Pontotoc County, numerous trees were uprooted; roofs were blown off of a house, garage, and 2 barns; a tree was blown into a house, and a well and well house were heavily damaged. In Seminole County, numerous trees were uprooted in the city of Seminole along with a carport being damaged, while in Sawakwa, also in Seminole County, trees were downed and blocked many roads. Minor damage occurred to a house in Mill Creek in Johnston County. Numerous tree limbs and power lines were also downed. The last report of damage came from Marietta in Love County where widespread wind damage occurred in the city of Marietta including damage to house roofs, cars and businesses. Numerous trees were downed, and 80 percent of the city was left without power. A semi-truck was also blown over.

#### Garfield County

(End)Vance Afb Enid 10 1940CST 0 0 Thunderstorm Wind (G50)

#### Payne County

8 W Cushing 29 2000CST 0 0 1K Thunderstorm Wind

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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November 1998

## ADDITIONS/CORRECTIONS

### OKLAHOMA, Western, Central and Southeast

#### Payne County

3.5 NNW Cushing to 4 N Cushing 29 2010CST 2 100 0 0 20K Tornado (F0)

A small tornado touched down northwest of Cushing and remained on the ground for 2 miles damaging trees, storage buildings, and several rural residences. Five sheet metal storage buildings and barns were either damaged or destroyed. Minor damage also occurred to a house and mobile home. The house had a porch, shutters, and roof shingles missing. The mobile home had many windows blown out. In addition to the tornado, straight-line winds caused minor damage to a rural home in southern Payne County 8 miles west of Cushing.

### TENNESSEE, East

#### Roane County

3 E Kingston 25 2045EST 0 0 5K Thunderstorm Wind  
Power lines down.

#### Anderson County

Clinton 25 2050EST 0 0 5K Thunderstorm Wind  
Trees down.

#### Blount County

(Tys)Mcghee Tyson Kn 25 2056EST 0 0 Thunderstorm Wind (G50)

#### Knox County

Knoxville 25 2059EST 0 0 Thunderstorm Wind (G51)

#### Grainger County

5 SW Bean Station 25 2100EST 0 0 Hail (0.75)  
3/4" hail and trees down on Lake Shore Road.

#### Loudon County

Eaton Xrd 25 2102EST 0 0 10K Thunderstorm Wind  
Trees down.

#### Hamblen County

Morristown 25 2110EST 0 0 20K 25K Thunderstorm Wind  
Power lines down on West Andrew Johnson Highway between National Weather Service office and Morristown. Windows blown out of houses and businesses in northeast Morristown. Bishop-Goodman shelter at Fred Miller Park in Morristown was demolished. Numerous trees down throughout the greater Morristown area. The storm knocked out power to around 3000 homes. Power was restored by the following day.

#### Hamblen County

Russellville 25 2115EST 0 0 Hail (1.00)

#### Hamblen County

Russellville 25 2115EST 0 0 Hail (1.75)

#### Jefferson County

Jefferson City 25 2115EST 0 0 30K Thunderstorm Wind  
Trees down in Jefferson City and throughout the county.

#### Claiborne County

Cumberland Gap 25 2120EST 0 0 5K 10K Thunderstorm Wind  
Trees and power lines down.

#### Cocke County

Newport to 5 E Newport 25 2120EST 0 0 7K 5K Thunderstorm Wind

Trees down in the city park and along I-40 5 miles east of Newport. A power pole also down in Newport.

#### Greene County

Greeneville 25 2125EST 0 0 15K Thunderstorm Wind  
Roof blown off mobile home on Jim Fox Road. Construction equipment blown over near Greeneville.

#### Hawkins County

Rogersville 25 2125EST 0 0 15K 20K Thunderstorm Wind  
Trees and power lines down throughout the area.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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November 1998

## ADDITIONS/CORRECTIONS

### TENNESSEE, East

#### Sevier County

2 W Pigeon Forge	25	2130EST			0	0	15K		Thunderstorm Wind
		Trees down.							

### TEXAS, Central Southeast

#### Austin County

North Portion	12	1020CST 1025CST			0	0			Flash Flood
		Portions of FM 109 flooded.							

#### Austin County

North Portion	12	1032CST 1330CST			0	0	10K		Flash Flood
		FM 109 flooded.							

#### Montgomery County

Northwest Portion	12	1045CST 1430CST			0	0	10K		Flash Flood
		Many farm-to-market roads flooded including FM 149.							

#### Grimes County

South Portion	12	1210CST 1400CST			0	0	10K		Flash Flood
		Many farm-to-market roads closed due to high water.							

#### Austin County

North Portion	12	1334CST 1630CST			0	0	5K		Flash Flood
		Many roads flooded across northern portion of the county.							

#### Montgomery County

Countywide	12	1334CST 1900CST			0	0	10K		Flash Flood
		Widespread street flooding.							

#### Austin County

Countywide	12	1641CST 1940CST			0	0	10K		Flash Flood
		Street flooding countywide. FM 2754 & FM 1371 closed.							

#### Washington County

Countywide	12	1720CST 1940CST			0	0	3K		Flash Flood
		Minor street flooding on the side roads.							

#### Harris County

North Portion	12	1830CST 1910CST			0	0	3K		Flash Flood
		Street flooding in the Willowbrook area.							

#### San Jacinto County

East Portion	12	1858CST 1910CST			0	0	3K		Flash Flood
		Street flooding across the region, especially near the Shell Oil Field.							

#### Liberty County

Cleveland	12	1901CST 1910CST			0	0	3K		Flash Flood
		Street flooding.							

#### Waller County

Waller	12	1908CST 1910CST			0	0	1K		Flash Flood
		Minor street flooding.							

# Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property		

November 1998

## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

#### Liberty County

Countywide	12	1945CST			0	0	5K	Flash Flood
	13	0055CST						

Minor street flooding countywide, especially in the Cleveland area.

#### Montgomery County

Countywide	12	1945CST			0	0	20K	Flash Flood
	13	0055CST						

Numerous roads closed across the region including HWY 105.

#### San Jacinto County

Countywide	12	1945CST			0	0	10K	Flash Flood
	13	0055CST						

Numerous roads flooded.

#### Fort Bend County

Countywide	12	2145CST			0	0	3K	Flash Flood
		2155CST						

Minor street flooding across the area, especially in the Peca Grove Subdivision.

#### Jackson County

Countywide	12	2147CST			0	0	20K	Flash Flood
	13	0055CST						

Numerous roads closed across the area including CR's 112, 282, 462, 319, and 320.

#### Austin County

Countywide	12	2154CST			0	0	20K	Flash Flood
	13	0055CST						

Major street flooding with numerous road closures.

#### Colorado County

Countywide	12	2154CST			0	0	5K	Flash Flood
	13	0055CST						

Minor street flooding across the region.

#### Grimes County

Countywide	12	2154CST			0	0	15K	Flash Flood
	13	0055CST						

Numerous road closures due to flooding.

#### Harris County

Countywide	12	2154CST			0	0	5K	Flash Flood
	13	0055CST						

Secondary roads flooded.

#### Waller County

Countywide	12	2154CST			0	0	3K	Flash Flood
	13	0055CST						

Minor street flooding.

#### Washington County

Countywide	12	2154CST			0	0	5K	Flash Flood
	13	0055CST						

Many secondary roads closed due to flooding.

#### Wharton County

Countywide	12	2154CST			0	0	3K	Flash Flood
	13	0055CST						

Minor street flooding across the county.

#### Polk County

Countywide	12	2245CST			0	0	3K	Flash Flood
	13	0055CST						

Minor street flooding countywide.

# Storm Data and Unusual Weather Phenomena

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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November 1998

## ADDITIONS/CORRECTIONS

### TEXAS, Central Southeast

#### Walker County

South Portion	12	2300CST			0	0	5K		Flash Flood
	13	0055CST							

HWY 150 from New Waverly to San Jacinto County line is closed due to flooding.

### TEXAS, Western North

#### Hardeman County

Chillicothe	09	1905CST			0	0	1K		Thunderstorm Wind
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#### Wilbarger County

Vernon	09	1914CST			0	0	0.20K		Lightning
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#### Wilbarger County

13 N Vernon	09	1914CST			0	0	0.20K		Thunderstorm Wind
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#### Wichita County

Electra	09	1952CST			0	0	2K		Thunderstorm Wind
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#### Wichita County

Sheppard Afb	09	2044CST			0	0			Thunderstorm Wind (G53)
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A line of severe thunderstorms moved across western portions of North Texas during the evening of the 9th, causing wind damage in many areas. Numerous trees and power poles were downed in Chillicothe in Hardeman County; a utility pole was blown down 13 miles north of Vernon in Wilbarger County, and a carport was destroyed in Electra in Wichita County. Lightning also struck a power pole in Vernon causing a power outage.

### VIRGINIA, Extreme Southwest

#### Washington County

Damascus to 2 NE Damascus	25	2243EST			0	1	30K	25K	Thunderstorm Wind
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Straight line winds blew off many barn roofs, downed power lines and demolished outbuildings. One person was injured when a mobile home was moved off its foundation. Initially this event was thought to be a tornado. However, after an aerial survey it was deemed straight line wind damage.

### WASHINGTON, Northwest

WAZ001>011-  
015>016

San Juan - Western Whatcom - Northern Casade Foothills - Central Casade Foothills - Northwest Interior - Everett And Vicinity - Seattle Metropolitan Area - Tacoma Area - Admiralty Inlet Area - Hood Canal/Kitsap Peninsula - Southwest Interior - North Coast - Central Coast

23	2100PST			0	0	6.5M		High Wind (G66)
24	0200PST							

Sustained winds up to 50 mph affected most of Western Washington. Winds in the Bellingham area gusted to 76 mph. Around a quarter of a million homes and businesses were without power during the storm. All of Whidbey Island's 26,000 electric customers were without power during the morning of the 24th. There were numerous trees down, which caused damage to houses, cars and other structures. Parts of Sea-Tac airport lost power and the Hood Canal Bridge was closed for several hours.

## Reference Notes:

### Fatality Location Abbreviations:

<b>BF</b>	<b>Ball Field</b>	<b>MH</b>	<b>Mobile Home</b>
<b>BO</b>	<b>Boating</b>	<b>OT</b>	<b>Other</b>
<b>BU</b>	<b>Business</b>	<b>OU</b>	<b>Outside/Open Areas</b>
<b>CA</b>	<b>Camping</b>	<b>PH</b>	<b>Permanent Home</b>
<b>EQ</b>	<b>Heavy Equipment/Construction</b>	<b>SC</b>	<b>School</b>
<b>GF</b>	<b>Golfing</b>	<b>TE</b>	<b>Telephone</b>
<b>IW</b>	<b>In Water</b>	<b>UT</b>	<b>Under Tree</b>
<b>LS</b>	<b>Long Span Roof</b>	<b>VE</b>	<b>Vehicle</b>

When reports are not received or are incomplete, the Storm Summary National Death and Injury totals may also be incomplete.

### Definition of Fujita Tornado Scale ( F Scale )

(F0) Gale tornado (40-72 mph) : Light damage;  
Some damage to chimneys; break branches off trees; push over shallow-rooted trees; signs and billboards damaged.

(F1) Moderate tornado (73-112 mph): Moderate damage; The lower limit (73 mph) is the beginning of hurricane wind speed; peel surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads.

(F2) Significant tornado (113-157 mph): Considerable damage; Roofs torn from frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.

(F3) Severe tornado (158-206 mph): Severe damage; Roofs and some walls torn from well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.

(F4) Devastating tornado (207-260 mph): Devastating damage; Well-constructed houses leveled; structure with weak foundations blown off some distance; cars thrown and large missiles generated.

(F5) Incredible tornado (261-318 mph): Incredible damage; Strong frame houses lifted from foundation and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 meters; trees debarked; incredible phenomena will occur.

(F6-F12) (319 mph to Mach 1, the speed of sound):  
The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.

*(F0+F1) Weak Tornado*

*(F2+F3) Strong Tornado*

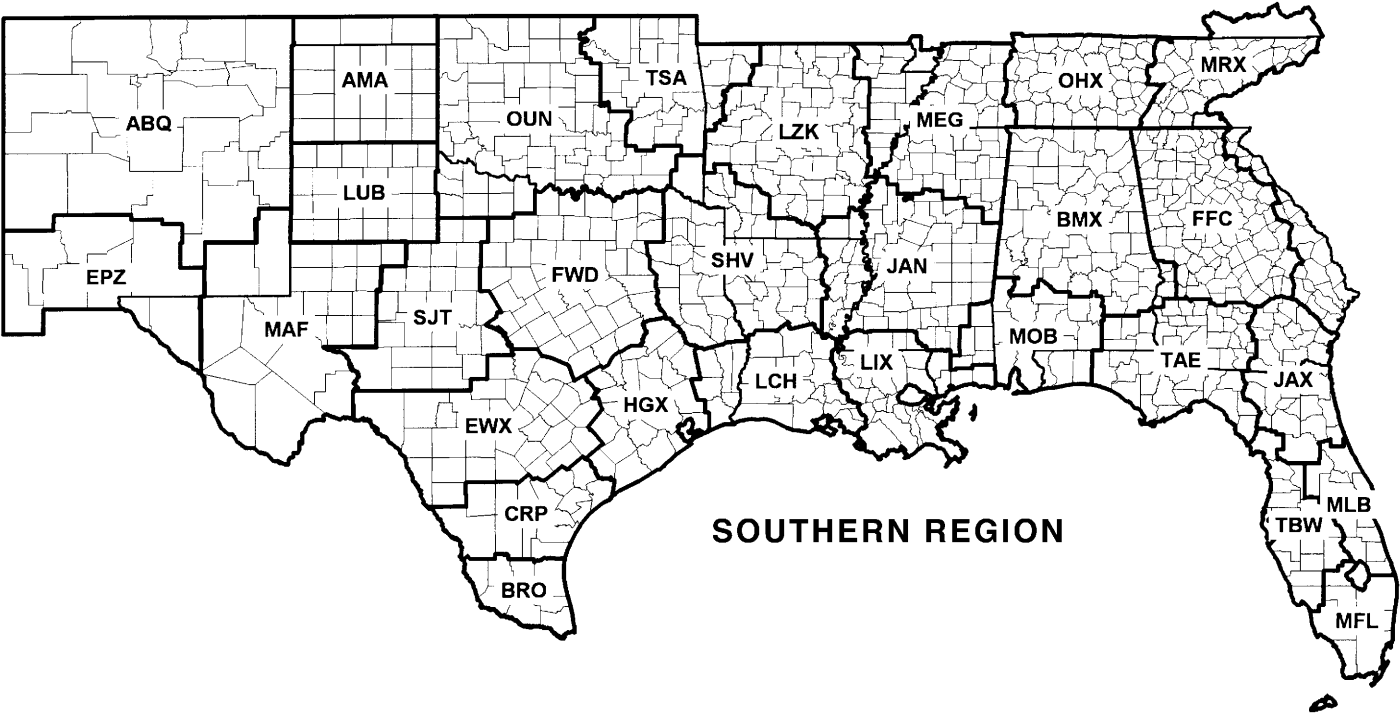
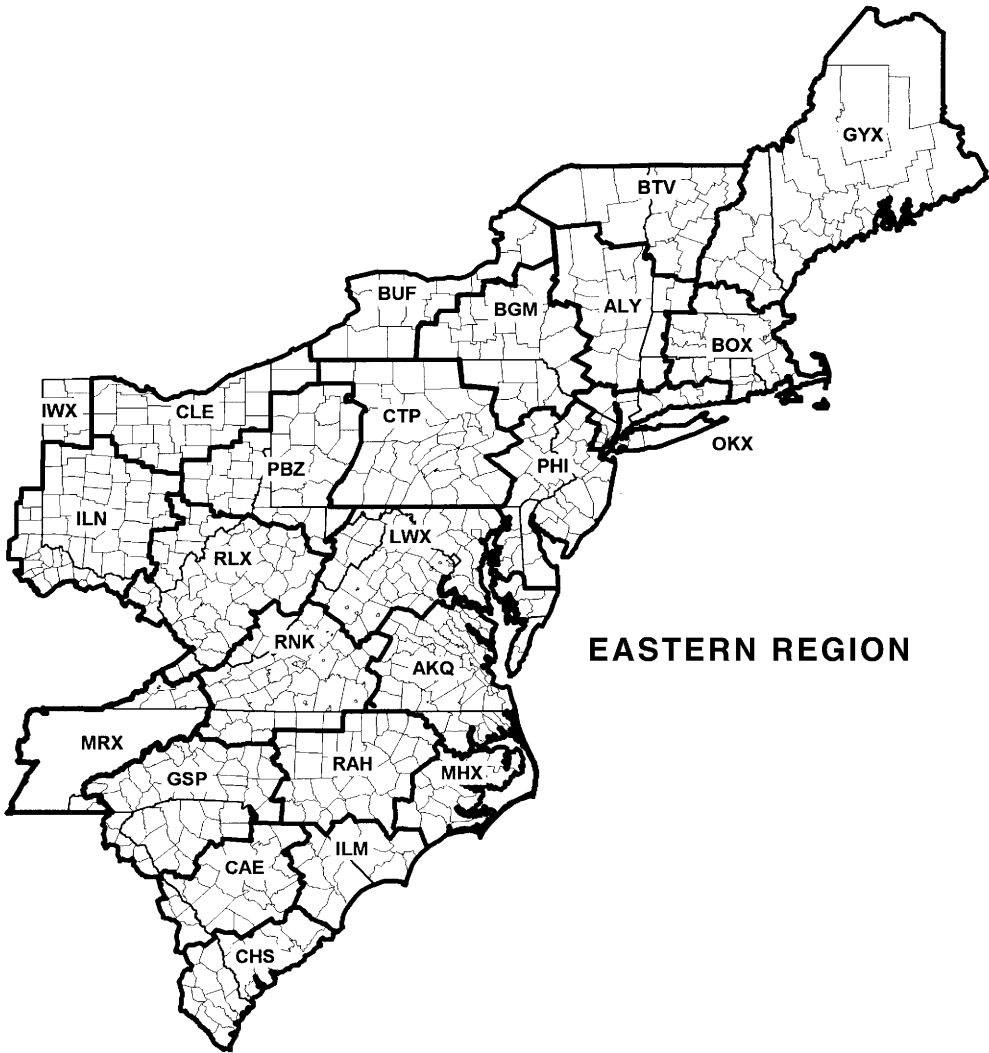
*(F4+F5) Violent Tornado*



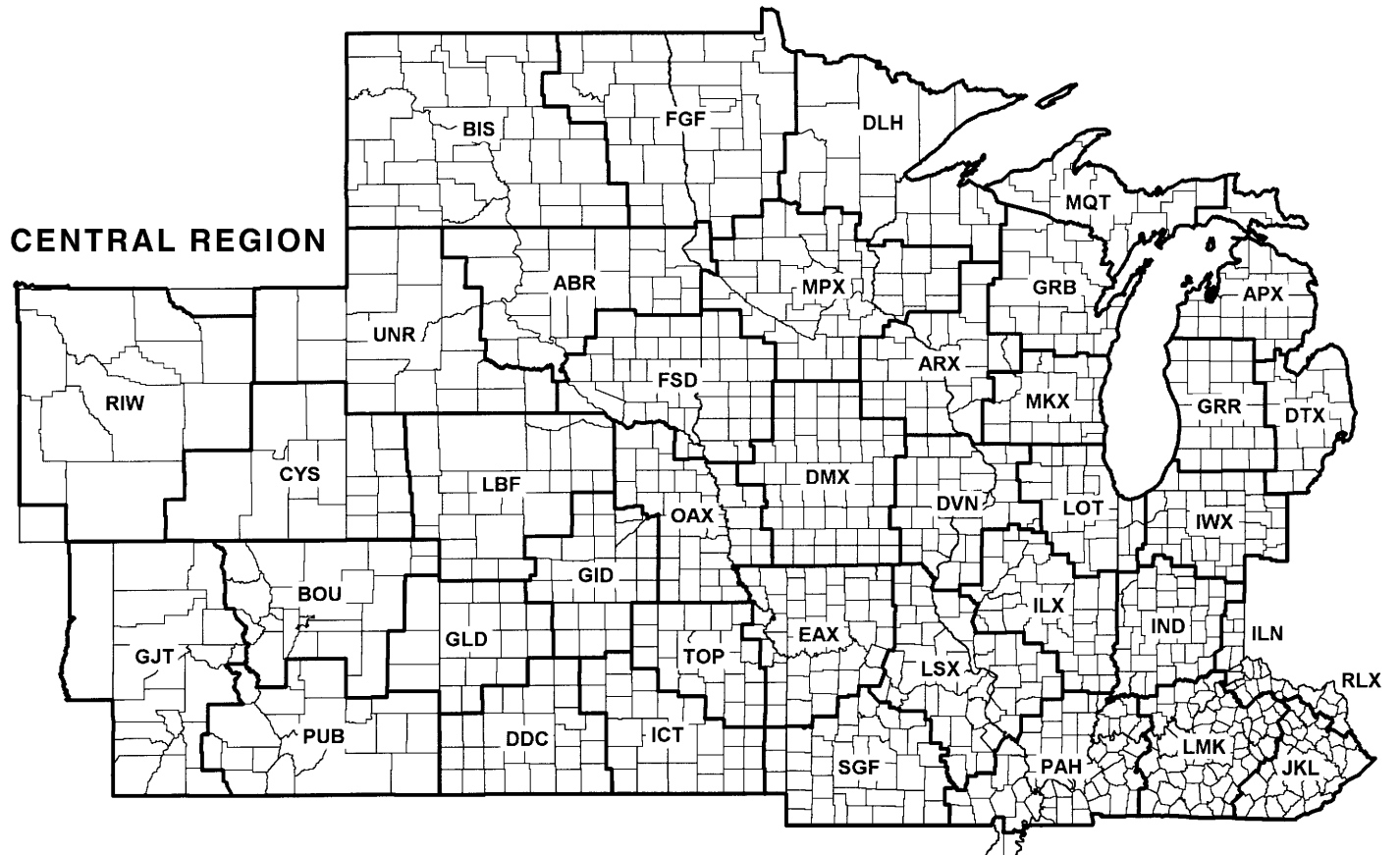
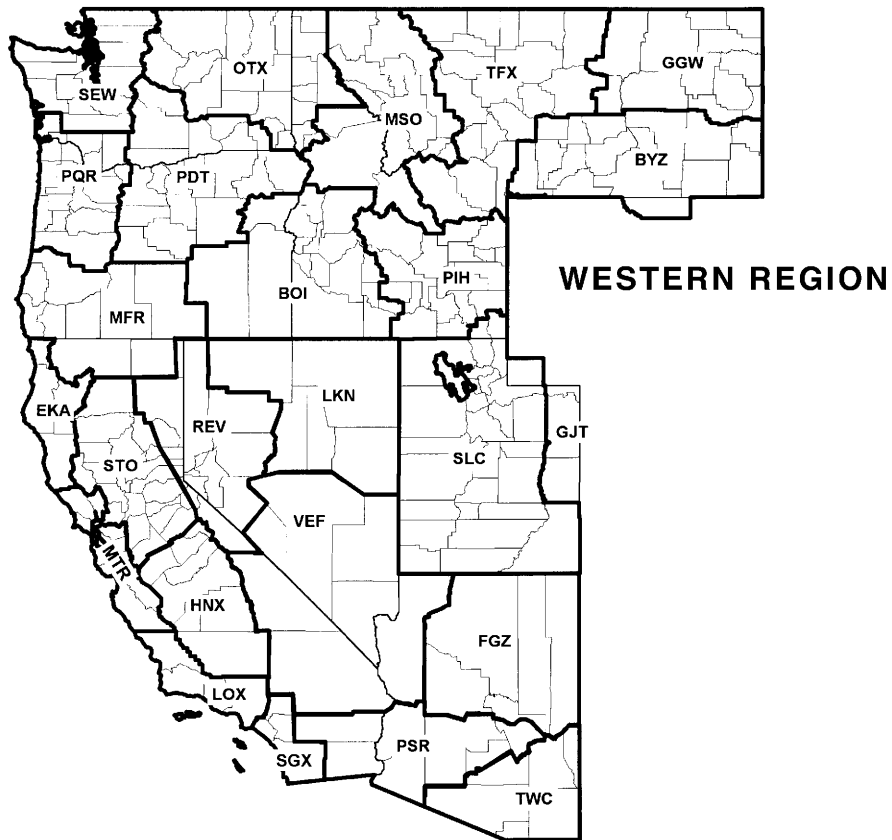
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From J. Atmos. Sci., August 1981, p. 1517-1519

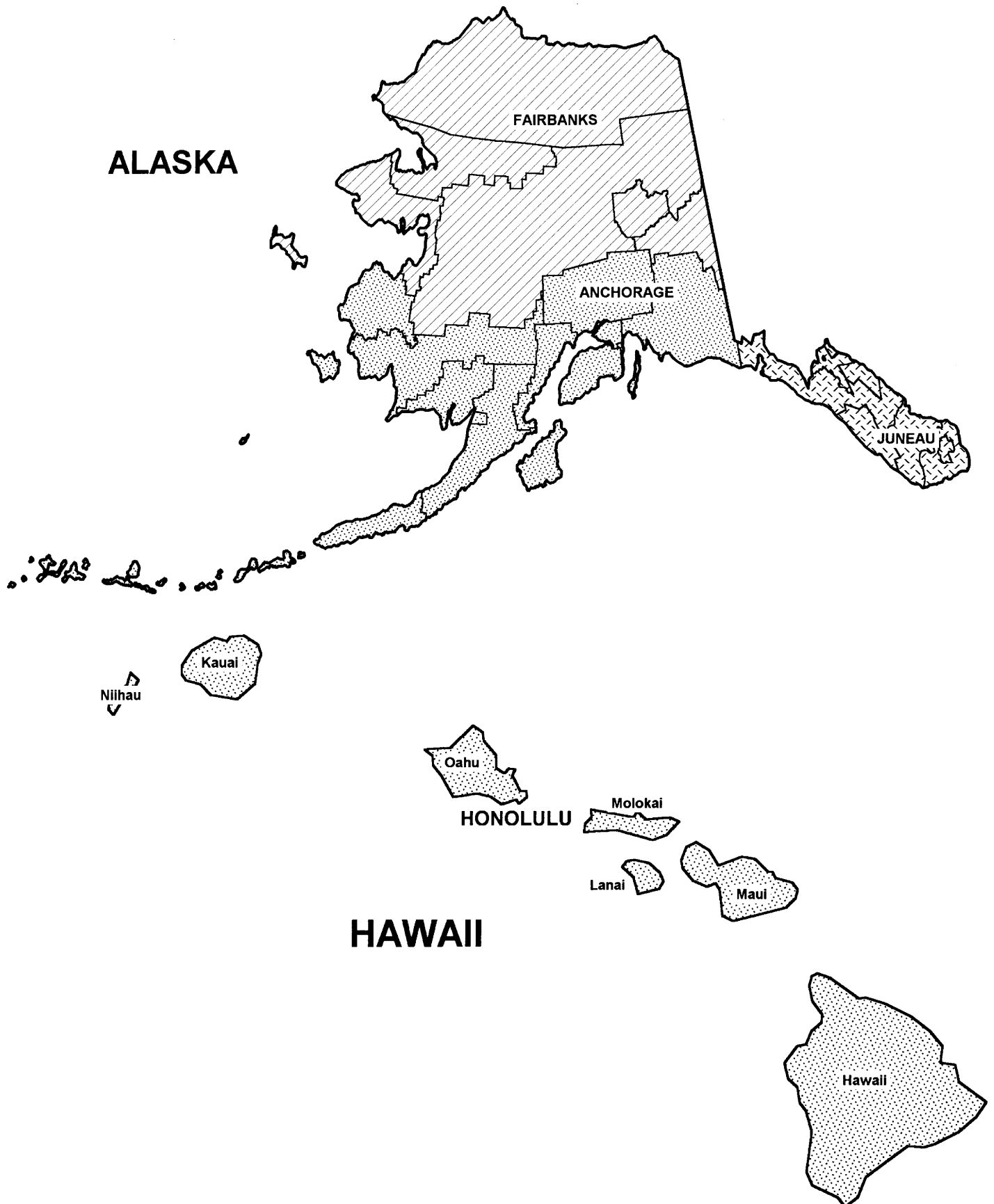
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# COUNTY WARNING & FORECAST AREAS - MODERNIZED NWS



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